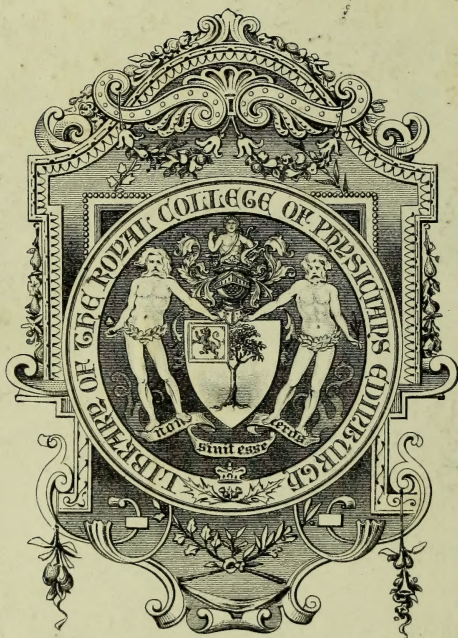




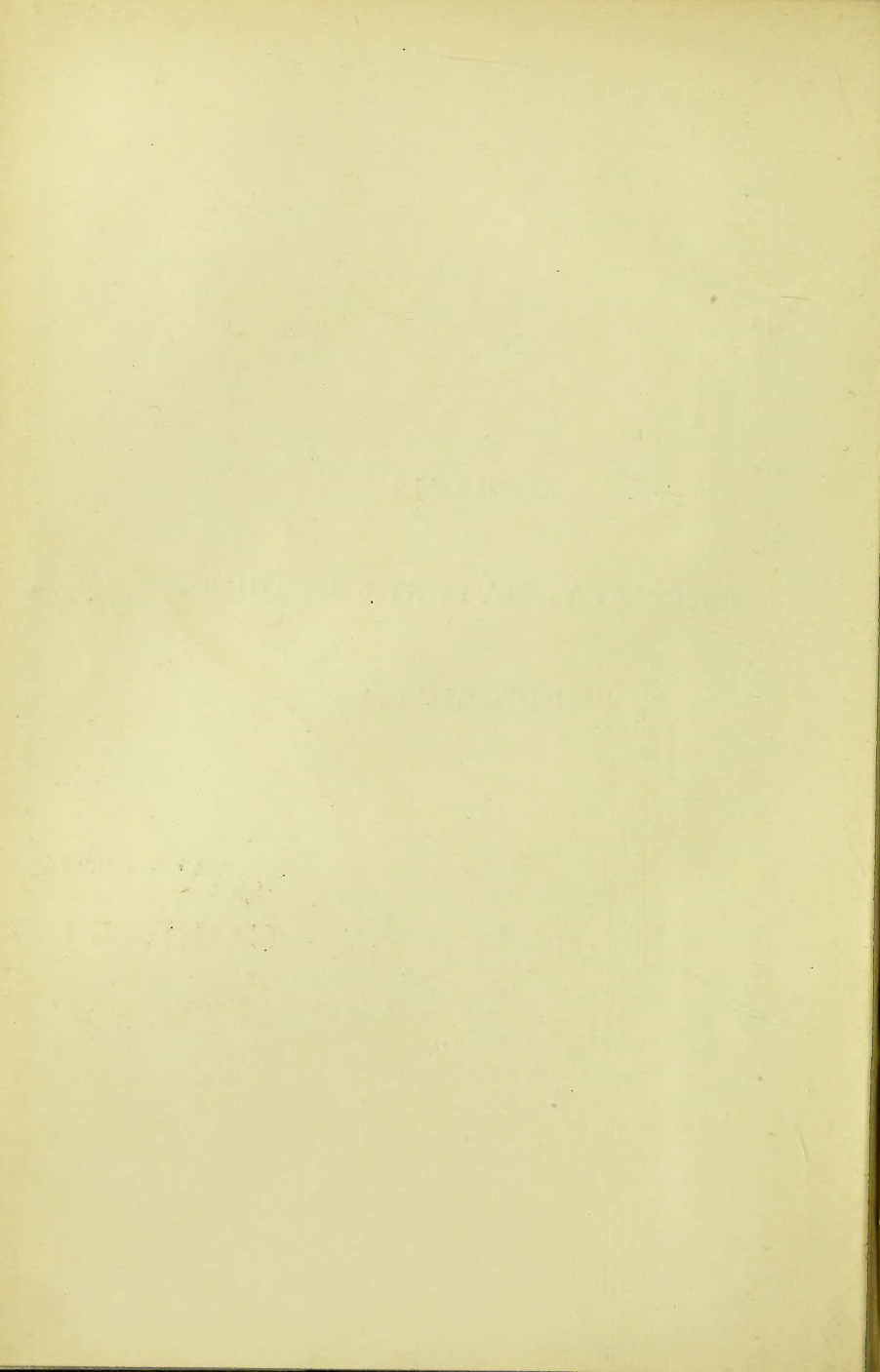
R38717

PRESS MARK

Press No. F6
 Shelf No. 3
 Book No. 89

9/ut

ELEMENTS
OF
PHARMACY, MATERIA MEDICA
AND
THERAPEUTICS.



315

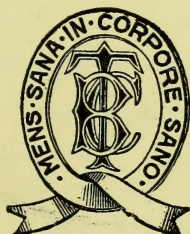
ELEMENTS
OF
PHARMACY,
MATERIA MEDICA,
AND
THERAPEUTICS.

BY
SIR WILLIAM WHITLA, M.A., M.D., LL.D.

PROFESSOR OF MATERIA MEDICA AND THERAPEUTICS, QUEEN'S
UNIVERSITY, BELFAST

AUTHOR OF
"DICTIONARY OF TREATMENT," "PRACTICE OF MEDICINE" (2 VOLS.), ETC.

NINTH



EDITION

THIRTY-SECOND THOUSAND

BIBLIOTH
COLL. REG.
MED. EDIN.

LONDON
BAILLIÈRE, TINDALL AND COX
8, HENRIETTA STREET, COVENT GARDEN

1910

[All rights reserved]

 **For Treatment in cases of
POISONING,**

See Index at end of the Book,

Page 625.

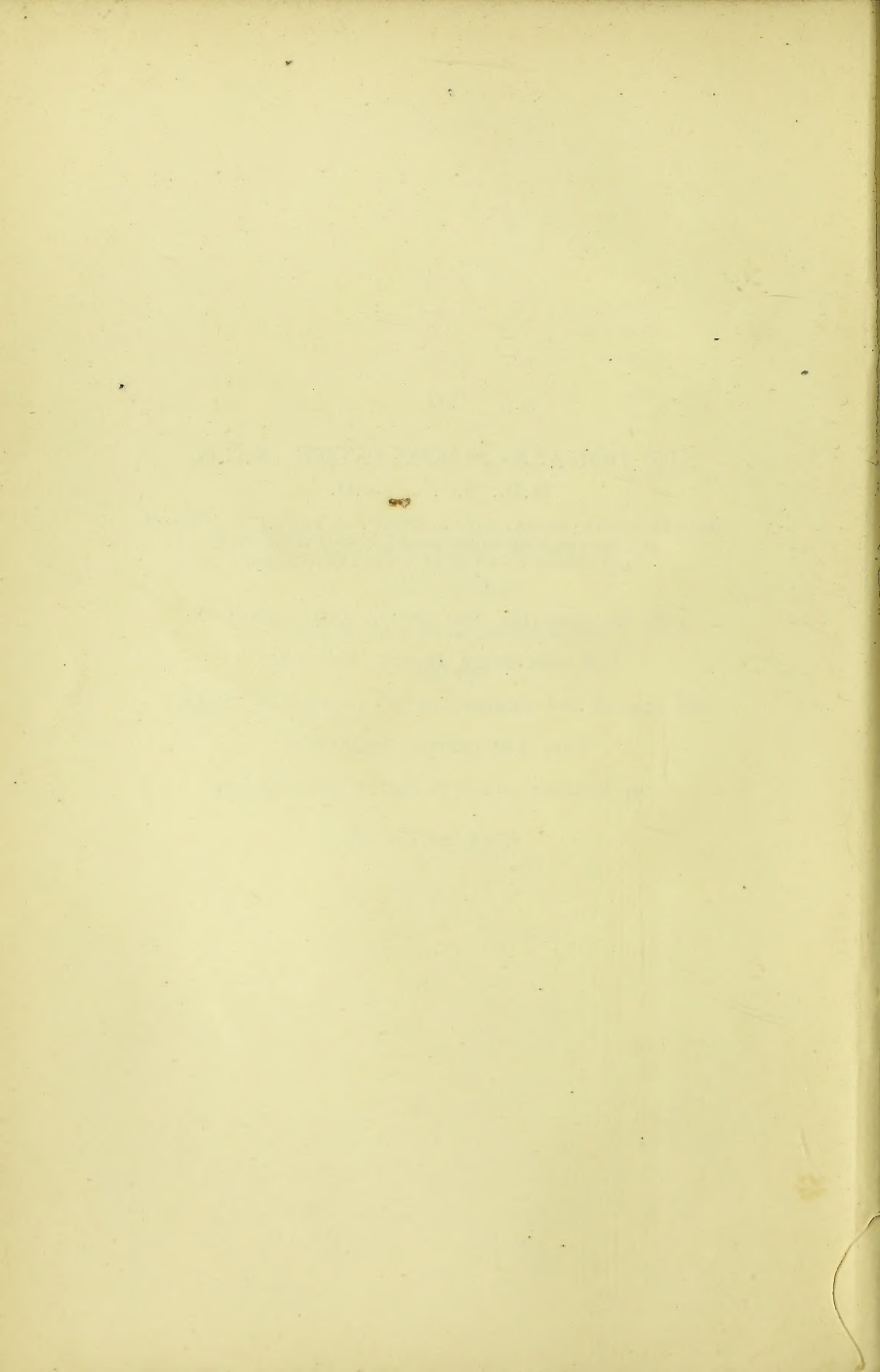
TO

SIR DONALD MACALISTER, K.C.B.,
M.D., D.C.L., LL.D.

PRESIDENT OF THE GENERAL MEDICAL COUNCIL OF THE UNITED KINGDOM
CHAIRMAN OF THE BRITISH PHARMACOPŒIA COMMITTEE
AND PRINCIPAL OF THE UNIVERSITY OF GLASGOW

WHO BY DEVOTING HIS GENIUS AND ENERGY TO
THE SERVICE OF MEDICAL EDUCATION
HAS PLACED THE MEMBERS OF HIS PROFESSION UNDER A
DEEP AND LASTING OBLIGATION
THIS VOLUME IS RESPECTFULLY INSCRIBED BY

THE AUTHOR



PREFACE TO THE NINTH EDITION.

THE present edition may fairly claim to be a new volume ; much of it has been re-written, and all of it has been carefully revised and brought up to date. The section on the Non-Official Remedies is for the most part new matter, a short description of several hundred remedies being now incorporated in it, including an account of the new Sera and Vaccines. The work is intended to be a companion volume to the author's " Dictionary of Treatment " and to his " Practice of Medicine."

He is again indebted to Dr. Victor Fielden, Demonstrator of Materia Medica and Pharmacy, Queen's University, Belfast, for his valuable revision of the proof sheets and for his construction of the index.

8, COLLEGE SQUARE N., BELFAST,

June, 1910.

PREFACE TO THE FIRST EDITION.

THE aim of this little work is to give to the student of medicine such information in a concise form as he generally has to sift out of two or more of the larger manuals.

The arrangement of the subject, which has been sanctioned by custom, has been departed from, the work being divided into distinct and separate sections, and the drugs arranged alphabetically. The writer found that most students, in grappling with *Materia Medica*, generally read the Therapeutics of each remedy once or twice over, while its preparations had to be committed to memory. Thus, a process of confused selection always distracted and prevented that clear view of each detail so necessary to ensure a thorough grasp of every branch of the subject. Many students, too, have already mastered the chemistry of each drug in the laboratory, and hence to such, an arrangement like the one adopted will probably be beneficial; whilst to those who have not, the condensed bird's-eye view of the subject may be appreciated. The writer is satisfied that this plan is open to serious objection, as is the most generally followed one, but he hopes that it may assist the already overtaxed student, who often fails to get any idea of the subject at all if the matter be not placed in a condensed form within his reach.

Actuated by the feeling that Pharmacy is one of the most important sections of *Materia Medica*, he has laboured to put this generally neglected branch in as attractive a light as possible, and has called to his aid the original woodcuts in the first part of the work. This brief outline of Pharmacy is in no way intended to replace that *practical* knowledge of the art which the writer believes should be an essential accomplishment of every educated physician, and which he hopes soon to see rendered compulsory by examining bodies.

CONTENTS.

	PAGES
INTRODUCTION - - - - -	xiii-xiv

PART I.

PHARMACY.

CHAPTER I.—Weighing—Measuring—Dropping - -	1-8
CHAPTER II.—Mixtures and Emulsions - - -	8-15
CHAPTER III.—Mixtures (<i>continued</i>)—Liniments—Lo- tions—Gargles—Injections and Electuaries - -	15-18
CHAPTER IV.—Powders - - - - -	18-24
CHAPTER V.—Pill Making - - - - -	24-30
CHAPTER VI.—Pill Coating - - - - -	30-35
CHAPTER VII.—Cachet Making - - - - -	36-37
CHAPTER VIII.—Tablet Making - - - - -	37-40
CHAPTER IX.—Capsule Making - - - - -	40-42
CHAPTER X.—Ointment Making - - - - -	42-44
CHAPTER XI.—Suppositories and Pessaries - -	44-47
CHAPTER XII.—Blister and Plaster Spreading - -	47-52
CHAPTER XIII.—General Hints - - - - -	53-57
CHAPTER XIV.—Official Pharmacy—Weights and Measures - - - - -	57-73

PART II.

THE ADMINISTRATION OF MEDICINES.

	PAGES
Routes by which Medicines enter the Blood—Posology	
—Modifying Factors—Incompatibility - - -	74-85
PRESCRIPTION WRITING—Grammatical Aids—Rules	
and Syntax - - - - -	86-93
LIST OF LATIN WORDS—Phrases—Abbreviations -	93-101
GROUPS OF THERAPEUTIC AGENTS—Physiological and	
Therapeutic Action - - - - -	102-111

PART III.

MATERIA MEDICA.

Chemical Reactions of the Official Remedies - -	112-130
Natural Orders of the Official Plants and their	
Preparations - - - - -	130-145
Tables of the Groups of the B.P. Galenical Prepara-	
tions - - - - -	146-172
Alkaloids—Neutral Principles—Glucosides—Gums	
—Resins—Gum - Resins—Oleo - Resins—Balsams	
—Stearoptenes - - - - -	173-174
OFFICIAL REMEDIES, with their Sources and De-	
scriptions, Preparations, Combinations, Strengths,	
Uses, Doses, etc., from Acacia to Zingiber - -	175-295

PART IV.

THERAPEUTICS.

PHARMACOLOGICAL AND THERAPEUTICAL ACTIONS OF	
EVERY OFFICIAL DRUG - - - - -	296-489

PART V.

NON-OFFICIAL REMEDIES.

	PAGES
NON-OFFICIAL REMEDIES, with their Pharmacology and Therapeutics, arranged alphabetically - -	490-617
INDIAN AND COLONIAL ADDENDUM - - -	618-624
INDEX OF POISONS - - - - -	625-634
GENERAL INDEX - - - - -	635-670

INTRODUCTION.

THE term MATERIA MEDICA in past years embraced a description of the agents used in the treatment of disease, their sources, composition, preparation, actions, and uses ; but owing to the rapid advance made in our knowledge of remedies, special terms are now used to designate the different departments in this extensive subject ; and we should confine the words

Materia Medica to the description of the physical characters of remedies, their origin, source, distribution, chemical composition, and the methods by which they are obtained, collected, preserved, etc.,

Pharmacy to the methods by which they are prepared and made ready for administration,

Pharmacology to the science of their action on a healthy organism, and

Therapeutics to their application in the treatment of disease.

Though some authorities continue to use the term " Pharmacology " in the same wide sense in which " Materia Medica " was formerly employed, in the present volume the word " Pharmacology " is strictly applied to the science which deals with the action of a drug or remedial agent upon a healthy body or upon a healthy tissue ; the terms " pharmacological action " and " physiological action " being regarded as synonyms (see p. 102, where the subject is considered at greater length).

The term " Materia Medica," even so restricted in its application as above defined, embraces Botany, Zoology, and Chemistry, and, indeed, is built up of these sciences.

The term **Pharmacodynamics** is occasionally used, even by modern writers, when referring to Pharmacology ; and the old cumbrous term **Pharmacognosy** is sometimes retained in text-books as a synonym of Materia Medica. Both these titles can be advantageously dispensed with.

We may divide the science and art of Pharmacy into two distinct divisions :

Extemporaneous Pharmacy, and
Official Pharmacy.

Under the first head are included the various operations of compounding and dispensing remedies from the prescriptions of the physician, and under Official Pharmacy will be briefly defined the different processes mentioned in the British Pharmacopœia in the directions given for the preparation of its numerous drugs and formulæ.

In the following pages, under the head of Materia Medica, in addition to the brief description of the physical characters, sources, chemical properties, doses, preparations, etc., of the various drugs in the " Pharmacopœia," will be grouped together the Official Preparations themselves, mostly in tabular form, so that the student can have a bird's-eye view of their composition and doses.

The Pharmacology of each drug will be given under its name in the section of this work devoted to Therapeutics, where its *pharmacological* or *physiological* action will be briefly discussed in connection with its *therapeutic* indications and uses.

Under the head of Administration of Medicines will be treated the science of writing and reading prescriptions, and a short glossary of terms and abbreviations used by physicians in ordering remedies. Under this division of the subject the classification of remedial agents and the important questions of dosage or posology and of incompatibility will be dealt with.

The Materia Medica, Pharmacy, Pharmacology, and Therapeutics of the most important drugs not yet included in the British Pharmacopœia will be detailed in the section dealing with Non-Official Remedies near the end of the volume.

PART I.

PHARMACY.

CHAPTER I.

EXTEMPORANEOUS PHARMACY, OR THE COMPOUNDING AND DISPENSING OF PRESCRIPTIONS.

THE term "Compounding" applies to the mixing, blending, or preparing of the drugs ordered in a prescription, while "Dispensing" refers to the way in which they are put up, labelled, and sent out to the patient: thus the incorporation of a mixture of several substances is spoken of as its *compounding*, after which it is to be *dispensed* in a flat, square, or round bottle; but if a prescription, for example, should contain an order for twelve 5-grain Dover's powders, it would be simply a case of dispensing, since the medicine is always kept compounded by the dispenser.

The practitioners of former days were in the habit of saying that "no one should be allowed to *write* a prescription unless he is able to *compound* it," and if such were the rule of examining boards, doubtless more useful and more elegant prescriptions would be the fashion, and even if the above adage were not true, the training requisite to make a good dispenser would be a great accomplishment to the practical physician, teaching him habits of neatness, readiness, and accuracy, and giving him a practical acquaintance with drugs obtainable in no other way.

The compounding of medicines can only be really learned at the dispensing counter; but a few general directions will be here given as a guide to the student. It is an essentially practical study; once the prescription is in the hand of the dispenser he must give to it his undivided and concentrated attention. Day-dreaming must be for the moment laid aside, and in proportion to the thoroughness with which he isolates himself from everything but the sheet of paper before him, so will his success be. The prescription should first be read carefully through, and any inconsistency of dose noticed. Difficulties in reading and deciphering will nearly always disappear on a careful comparison of the formation of the letters in the doubtful word with those in the unmistakable portions of the prescription. If an evidently

poisonous, or even an unusually large dose is ordered, or if substances absolutely incompatible are prescribed, it will be well to consult the prescriber before proceeding further, but this will not be a likely or common occurrence. In compounding almost every prescription, there are several processes continually being employed which deserve a few passing remarks.

Weighing, the essential element of which is accuracy, is generally only required in dealing with small quantities, as rarely more than 1 ounce of any solid is ordered in a prescription; more commonly it is only with grains that the dispenser is directed to work, and in dealing with quantities from a few grains to as many drachms, the ordinary fixed upright beam and scales which are found on every dispensing counter, answer all purposes. They are generally provided with one movable glass pan, which should be opposite the operator's right hand, and on to which the substance to be weighed is to be gradually placed, the weights having been previously put on the opposite scale. The pan, or scale, should invariably be wiped with a dry cloth each time after use. The omission of this is one of the minute points which stamps a slovenly compounder, and, as a rule, he who will not take the trouble to leave his scales and weights in a tidy condition will not take the trouble to weigh accurately the medicines prescribed.

For minute quantities of powerful drugs, like morphine, strychnine, and most active substances under 2 grains in weight, the scales that are being constantly used to weigh as much as two or three drachms should not be employed. For this purpose more delicate scales or a chemical balance should be used, and the substance gradually added, particle after particle, from a small spatula, till the scale comes to the level of the opposite, and remains there, as indicated by the pointer. In this manner $\frac{1}{100}$ grain can be easily appreciated.

It is very often necessary to weigh small quantities of soft extracts for pills. This should only be done in this way:—Two little pieces of smooth writing paper should be made of the same size, which is accurately done by cutting a piece out of two sheets, one placed in contact with the other. When two pieces of precisely the same size and weight are thus obtained, one should be placed on the left-hand scale along with the weights; the other is to receive upon it the soft substance, and to be placed on the opposite scale, and when the requisite weight of material is added, it can easily be detached from the paper with a knife. The same plan should be used with corrosive substances, like iodine, if the scale-pan is not of glass.

The Pharmacopœia recognises no weight between a grain and an ounce, the ounce being equal to $437\frac{1}{2}$ grains, and the pound being equal to 16 ounces, or 7,000 grains.

It will be seen that in this weight, which is called the Imperial Standard or Avoirdupois weight, there is no drachm or scruple,

but in the preface to the Pharmacopœia it is written that "it will be optional with the physician *in prescribing* to use the symbols of the drachm (ʒ) and the scruple (ʒ), the former representing 60 and the latter 20 grains." However, it is now becoming the custom to order solids by grains or ounces, and to confine the use of the drachm to the liquid measure of 60 minims, or the eighth part of a *fluid* ounce.

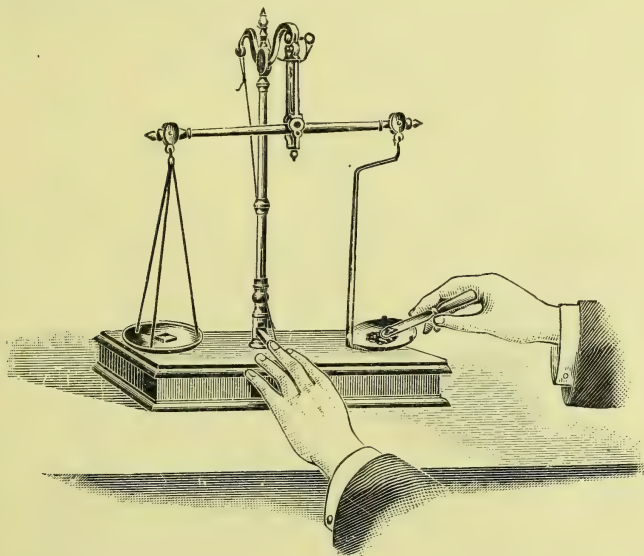


FIG. 1.

If, therefore, the dispenser meets with a drachm or a scruple of a solid substance in a prescription, he is to put in 60 or 20 grains—though strictly about $54\frac{1}{2}$ grains and 18 grains are respectively equivalent to the $\frac{1}{8}$ and $\frac{1}{24}$ of an avoirdupois ounce.

The Metric system which has been introduced into the present Pharmacopœia should be understood by all students and dispensers. All weights and measures in this system are easily calculated, being either multiples or fractions of ten. A prefix is used to indicate each quantity—deka= 10 times, hecto= 100 times, kilo= 1,000 times, deci= $\frac{1}{10}$, centi= $\frac{1}{100}$, and milli= $\frac{1}{1000}$. For example, 1 kilogramme= 1,000 grammes, 1 centigramme= $\frac{1}{100}$ gramme, etc. The foundation upon which all the metric weights and measures are built is the metre, which was considered to be the one ten-millionth part of the distance between the pole and the equator, and is equal to 39.37 inches. The

metre is divided into tenths, hundredths, and thousandths, the hundredth being, of course, 1 centimetre. The *cubic* centimetre (commonly written 1 c.c.) is the connecting link between measure and weight, for the *weight* of 1 c.c. of water at 4° C. is termed a gramme (= 15.432 grains). 1,000 c.c. is the basis of measure by volume, and is called 1 litre (= 35 ounces 1 drachm 35 minims). The cubic centimetre is therefore practically equivalent to the one-thousandth part of the litre (one millilitre).*

It has now been arranged, with the consent of the Board of Trade, that the words—

Mil,
Decimil,
Centimil,

may be used: the *mil* being equivalent to the cubic centimetre or the millilitre; the *decimil* being equivalent to the tenth part of a millilitre; and the *centimil* being equivalent to the one-hundredth part of a millilitre. The minim of the British Pharmacopœia is equal to 5.9192 centimils, and the other equivalents of these new measures will be found on p. 70.

In another part of the book will be found tables giving the various weights and measures of this system with their English equivalents.

The **Measuring** of liquids is a simple process, but, like many others, requires care and practice, and should be done always according to rule. Graduated glass measures are used of various shapes, which should have the lines marked both in front and at the back. The measure should be held between the thumb and next two fingers of the left hand (Fig. 2), and raised nearly to the level of the dispenser's eye. The bottle to be poured from is grasped firmly by the right hand, the stopper being previously withdrawn and held by the little finger of the opposite hand. The fluid is then poured out, the foot of the measure being held horizontally, the level of the liquid being tested by the lines on its front and back aspects. In looking through a quantity of liquid in a glass, two lines, or a double line, may be noticed, the upper one being caused by the concave surface of the liquid, produced by capillary attraction. The lower line, which is the true level, is the one to be taken into account in measuring. *Never pour out with the label downwards*, otherwise the drop of moisture left on the lip will trickle down and injure it. The label should be *always* on the side of the bottle which is upwards, as in the Figure.

* It must, however, be borne in mind, as pointed out by Mr. Martindale, that the measure of 1,000 c.c. recognised by the British Pharmacopœia is not really a litre. The litre is the volume of 1,000 grammes of distilled water taken at 4° C., whilst the British Pharmacopœia volume of 1,000 c.c. is the volume of 1,000 grammes of distilled water taken at 15.5° C.; a millilitre therefore is strictly speaking equivalent to 1.00016 c.c.

For measuring small quantities of medicine (and it is generally an active medicine that is ordered in small quantity) the measure which is used for ounces should not be employed, as it will be found impossible to be accurate in pouring a drachm into the bottom of a two-ounce glass. The measure which is figured should be then used ; it is known as a minim measure, and is of the capacity of either one or two drachms.

It may be held like the larger glass, but the careful and neat dispenser will hold it as in Figure 3, which does not interfere

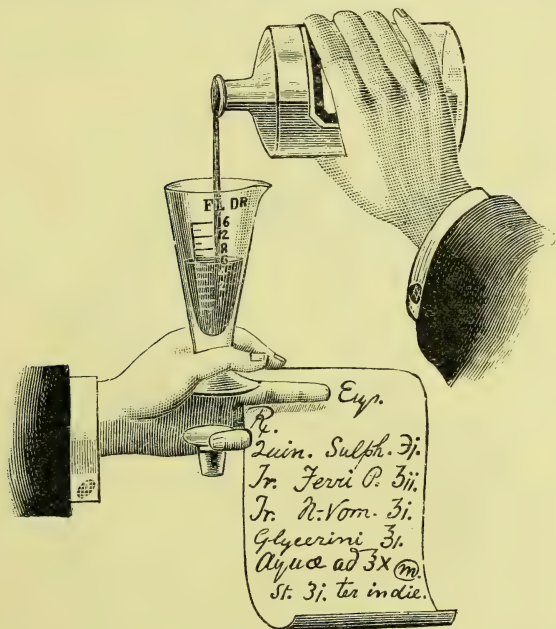


FIG. 2.

with the light passing through even a minute quantity near the bottom. Some hold the larger measure in the same way. In measuring liquids in very narrow glasses like the one figured, the surface of the liquid will be found to be *deeply* concave, owing to capillary attraction being stronger than in wide vessels, and it is sometimes puzzling to get the true level, which should be midway between the highest point close to the glass, and the lowest in the centre. It is not safe to count upon the lowest line as in working with the larger measures, because if we did the fluid which is attracted to the glass would not be included.

The smaller quantities represented by mils, decimils, and centimils should be measured by graduated pipettes. Substances like copaiba and castor oil should not be measured—not, however, because of the reason always assigned, that the measure is so difficult to clean, for accuracy should sacrifice every other consideration in compounding, but because of the fact that if 1 ounce of such a substance is carefully measured about seven-eighths of it only will be got out of the glass. Hence it is advisable either to weigh it, making allowance for its specific gravity, or else to pour it into the bottle in which it is to be dispensed, having previously marked with a strip of paper the space or bulk occupied by an ounce of water in the same bottle.

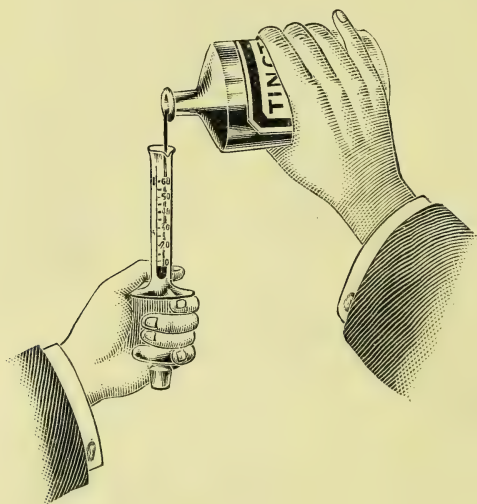


FIG. 3.

Before returning the stopper into a bottle out of which a liquid has been poured, the drop that hangs from the lip should be caught upon the bottom of the stopper by simply touching it—thus continual moisture is generally prevented from trickling down the side of the bottle; this little detail should be carefully attended to in the case of acids, corrosive liquids, oils, and syrups.

Dropping.—The bottle should be lightly grasped in the right hand by all the fingers, except the index one, and held in a vertical position with the bottom downwards, till the stopper is lifted partially out by the fingers of the left hand, and held there by the right index finger, which presses it downward as the bottle

is sloped to allow the liquid to drop out. Before permitting the drops to fall into any quantity of other medicine, a few should be allowed to drop on the floor till the dispenser is satisfied he has perfect control over the regularity with which the drops issue from the bottle in his hand, otherwise they might come out with a rush, rendering it impossible to count them, in which case the liquid or medicine into which they fall must necessarily be rejected. This may be avoided by the unpractised dispenser allowing the drops to fall into an empty measure, when, if too many flow out, he can reject them without risking the liquid into which they are to go, but if the drops be volatile, this should not be done. Liquids like chloroform, hydrocyanic acid, ether, nitrite

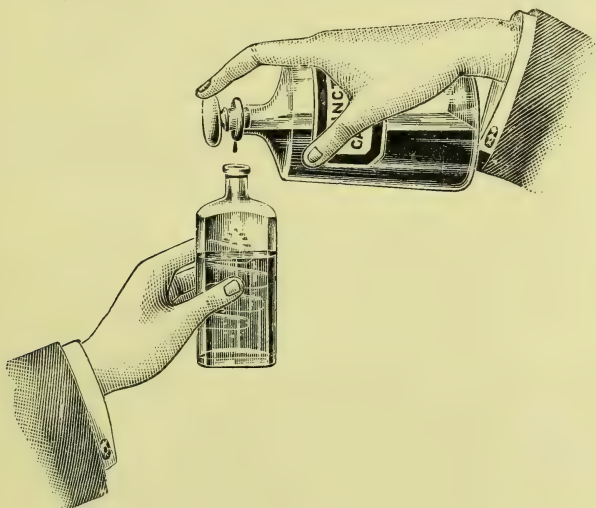


FIG. 4.

of amyl, etc., should not be dropped, but always measured. A 10 or 20 per cent. solution of such substances can be kept in stock, so that there may be no difficulty in accurately measuring the smallest quantities, as when two or three drops of dilute hydrocyanic acid are ordered in a draught.

It is a good rule to let each drop reach its destination before another flows out. If the drops hesitate to flow at the start, the lip of the bottle should be wetted. When the dropping has concluded, the stopper is taken altogether out for an instant to allow the liquid accumulated about the neck to flow back again into the bottle before the stopper is thrust home; various bottles, with patent stoppers, have been devised to facilitate

dropping ; but, as a rule, every requirement is met by the above plan. The student should remember that a drop is a vague and indefinite quantity, supposed to be identical with a minim, which it seldom is. Elaborate tables have been prepared, showing how many drops of certain liquid preparations are found to correspond with 1 drachm : thus it is generally stated that there are 120 drops of tincture of digitalis or laudanum in 1 fluid drachm, and 45 of Prussic acid in the same bulk. It is, however, well known that the number and size of the drops depend, not so much upon the nature of the liquid, as upon some accidental circumstances—as the shape and size of the stopper, or especially *the shape of the lip of the bottle*, and the degree of moisture about it, etc. The practice of ordering drops should be entirely given up, and minims directed to be measured instead, unless, perhaps, when two or three drops of a flavouring essence are ordered in a mixture.

Hydrocyanic acid is best measured with a long graduated pipette or syringe, and many other liquids could be treated in a similar way with advantage. A graduated pipette with a small indiarubber teat or bulb at its blunt extremity answers most cases.

CHAPTER II.

MIXING OR MIXTURE MAKING.

THE term “Mixture” in Pharmacy includes every extemporaneous fluid compound intended for internal use, except a few bearing distinctive names—as draughts or enemata. It would be difficult to give such general directions to the dispenser as would equally apply to the preparation of so many really different compounds—as solutions, emulsions, decoctions, etc. ; but a little practical experience will soon show him how he may apply the knowledge gained in making one class of preparations to aid him in compounding another.

Mixtures are prescribed and dispensed in 2, 3, 4, 6, 8, 10, and 12 ounce bottles, and occasionally in 16 and 20 ounce ; and taking the simplest form of mixture where two or more fluid medicines are ordered together, it will be seen that the compounding of this will only mean the measuring of the different ingredients in a glass and pouring them into a bottle ; still, this must be done methodically, and attention to the following is advisable :—Until the dispenser has had considerable experience he should, after reading over the prescription, carry the different medicine bottles required from their different places and set them down beside him before he begins to measure, otherwise he may “lose his head,” or get confused in travelling from one

part of the surgery to another. This practice, however, should be no excuse for bottles being left upon the dispensing counter. It will be noticed that in carrying a stock bottle from its shelf, collecting it with others where the dispenser is to work, and putting it back after he has finished, its label will be certain to be examined at least *three* times. It is of the utmost importance that each stock bottle be put back in its proper place, as mistakes afterwards are liable to occur owing to the misplacement. The skilful compounder will make up a mixture more expeditiously by taking the measure-glass in the left hand, as if about to use it as previously described, and the prescription between the middle two fingers of the same hand, and, proceeding with his right hand entirely free, walking to and fro, he can compound his mixture as quickly and accurately as if all were within reach of his hand—as they should be when possible. This is well shown in Fig. 2. Care is requisite to prevent the prescription being soiled.

As regards the *order* in mixing liquids for a simple mixture it is not of so much importance as in making emulsions, and often the ingredients can be mixed in the order in which they are written. It is a good plan to pour the tinctures or spirituous fluids (as they are measured) into the bottle in which the mixture is to be made, mix them, and then add the syrups or essences, and finally fill up with the water or infusion ordered ; in this way a better mixture is often made than if the tinctures were each singly added to a large body of water, when their resinous principles would be sure to be precipitated. Suppose in a prescription of 8 ounces of mixture, containing 2 ounces of tinctures, 1 ounce of mucilage, and 5 ounces of water, if the dispenser added the mucilage to the undiluted tinctures, an unsightly mess would be the result ; the mucilage should either be added last or be largely diluted with the water, before adding the tinctures ; but the difficulty about the *order* of mixing ingredients will be found to be more imaginary than real—a little common sense and experience will soon overcome it.

There is, however, one rule which is almost universally neglected, and it is of importance :—If there be a very poisonous substance, like Prussic acid, strychnine, aconite, arsenic, corrosive sublimate, etc., ordered in a mixture, it should be put in the *last thing* before corking, unless there be some reason for the contrary. The force of this is obvious, for, if this be the dispenser's habit or rule, the possibility of his putting it in twice is out of the question ; and often when the attention is unavoidably arrested, the ablest will forget what he has just accomplished. All mixtures should be briskly shaken before the label is put on, to insure thorough incorporation.

Distilled water should be invariably used ; no doubt, in many instances, it will be of little moment, but a mixture made at one time with distilled water and at another with fountain or pipe

water, will look or taste differently ; and, on the whole, it will be found advisable to use it to insure uniformity.

Should a mixture be filtered if not bright and clear ? Unless specially ordered it should not, or unless some of the articles employed in its preparation were not as bright as they should be ; it should always be strained through wetted wool or tow plugged lightly into a funnel, if any foreign particles are observed in it ; this will almost always be necessary if the mixture has been made in a mortar ; and most of the next class of mixtures get dirt incorporated with them, no matter how careful the dispenser is, and there are often foreign particles mixed up with the salt



FIG. 5.

before solution which are not visible till water is added. It will be always necessary to run a little water through the strainer before pouring in the medicine (see under Filtration, on p. 62, where the terms " brightness," " muddiness," and " clearness " are explained).

Suppose the prescription contains a solid substance to be dissolved in the mixture, the dispenser, if the substance is very easily dissolved, may weigh it, drop it into the bottle by means of a little paper bent into a V-shape (off which most powders will pour like liquids), add the water or vehicle ordered, and shake briskly till the salt is dissolved ; this often does away with

the necessity of straining ; but if the salt dissolve slowly, or if there be more of it ordered than the water will dissolve, then it must be rubbed up with *cold* water in a mortar with a pestle—to use which skilfully and neatly requires a good deal of practice and care.

Fig. 5 represents the mortar being used to triturate a hard substance. The pestle is firmly grasped by the right hand, and power is applied from the *shoulder and arm, the wrist being kept rigid*, and the elbow nearly stiff. By a series of rotatory movements, chiefly at the shoulder joint, the pestle is made to travel slowly round the sides of the mortar—always being brought in the same direction, that is, *towards* the operator's body, not from it—each rotation becoming shorter and quicker until the centre of the mortar is reached, when a few large sweeps bring it out to the sides again, and the same movements are repeated as before—the object being to crush each particle between the sides of the mortar and the pestle. The mortar should be steadied by the left hand, and as the material gathers towards the handle of the pestle, it is to be scraped off with a spatula—which should occasionally be swept round the inside of the mortar. In this manner hard gritty substances are reduced to a fine powder.

If a larger quantity of salt is ordered than the water will dissolve, it should be in this way well rubbed up with successive portions of cold water, and dispensed as a fine powder lying at the bottom of the mixture, and not, as is often done, presented to the patient in large crystals which he doubts whether to swallow or reject. Warm water would probably dissolve the salt and give a clear mixture, but, on cooling, large crystals would form on the bottom and sides of the bottle.

Another class of mixtures is often ordered where a vegetable powder, as rhubarb or ginger, or a substance like precipitated sulphur or bismuth, is directed to be compounded with water generally thickened with a little syrup or mucilage, in which cases the most careless would hardly think of pouring the powder into the bottle and filling up with water, as it would thus reach the patient in little hard lumps or pellets. The powder should be weighed and put into a porcelain or wedgwood mortar, with as much water as will make a thin paste, and after rubbing it till it reaches the consistency of a thick cream, more water is gradually added till a uniform mixture is obtained. The trituration here is of a different nature to that required in powdering substances or grinding them, as in the last figure. In this instance the powder is already fine, and only its intimate admixture with water is required—hence the mortar is used in a different way, as Fig. 6 shows. A swift graceful movement is communicated to the pestle by the *wrist*, the handle being lightly grasped as a pen is held, and no motion should be allowed at the elbow or shoulder ; as in the last instance, the pestle is

made to sweep round the sides of the mortar always in the direction inwards or towards the dispenser, never "off" him. If syrup or mucilage is ordered to help the suspension of such powder in a mixture, it is advisable to rub the powder up with a little of it first before adding water, and shaking all thoroughly before labelling.

When calcined magnesia is ordered in a mixture, an exception to the above rule of rubbing in a mortar may be made; thus, suppose an 8-ounce mixture, with 2 ounces of syrups or tinctures, 2 drachms of magnesia, and 6 ounces of water, be prescribed, here the dispenser may measure the water first in a large measure, weigh the magnesia and drop it on the surface of the water, when

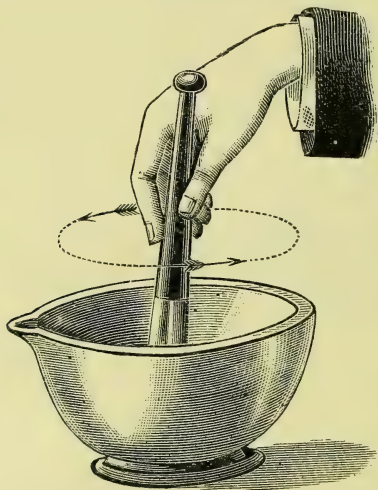


FIG. 6.

it will gradually sink to the bottom as a perfectly smooth and uniform sediment. During its sinking he measures out the fluid ingredients, pours them into the bottle in which they are to be dispensed, by which time the magnesia and water are ready for pouring in on the top of them. This completes the mixture, which is whiter and more uniform than if rubbed up in a mortar, however clean.

Often a good deal of trouble is experienced with the froth that rises, especially upon vegetable solutions after agitation, which prevents the bottle being filled or corked. A few drops of spirit cause this to rapidly disappear; and it is a good plan, if there be any spirituous liquid in the prescription, to keep a little of this to the last for this purpose. All mixtures with any deposit should

have a label directing the bottle to be shaken before pouring out ; and in all cases where the dispenser is in doubt about a mixture depositing a sediment, he should err on the safe side, and put on a " shake the bottle " label before sending it to the patient. It is a custom to direct all mixtures containing prussic acid to be shaken before use. This has arisen from a mistaken notion that the acid floats upon the top when the mixture is allowed to rest. Such is not the case, but the very volatile ingredient in a half-filled bottle of mixture may rise in vapour and condense upon the inside of the empty part of the bottle, and on a dose being poured out it would contain a relatively larger proportion of the volatile substance ; hence even in these cases a " shake the bottle " label should be put on, one thing being certain—that it can do no harm even if unnecessary.

The next class of mixture includes emulsions. They require more care and skill in their preparation and prescribing than most other extemporaneous compounds. An emulsion is a watery mixture resembling milk in appearance, containing an oil or resin in suspension, and not capable of easy or ready separation. The suspension of the oil or resin is effected through the agency of several substances, as gum, soap, alkali, or yolk of egg.

Several substances when rubbed up with water in a mortar make perfect emulsions ; the gum-resins, ammoniacum, myrrh, and asafetida behave in this way. The milky mixtures thus prepared are called *natural* emulsions, and the explanation of the phenomenon is simple—each substance contains, in addition to its resin, as much gum as will suspend it when water is added. If the pharmacist wishes, then, to make an emulsion with a resin, he imitates this natural preparation by adding gum acacia or tragacanth, as in the official mixture of guaiacum, in which the resin is ordered to be triturated with a little sugar and tragacanth, the cinnamon water being added gradually. The mucilage for emulsions should be always recently made, and should not show any acid reaction. The mucilage made from pulv. acaciæ is generally acid, and consequently that made with lump gum is much superior. To make this, however, impromptu is not generally possible, but if made in large quantity it can be kept for some time in a perfectly fresh condition by completely filling a number of 3-ounce bottles, corking them tightly, and after cutting off the corks flush with the mouths of the bottles, dipping the necks into a little melted wax or hard paraffin. The mucilage is thus kept free from air, and will be found most satisfactory in every way even after some weeks.

Oils are emulsified either by rubbing with gum or by adding an alkali (which makes soap with the oil), or by both gum and alkali, which is the most common method. Copaiba is made into an emulsion in a similar manner. Volatile oils require to be mixed with some fixed oil before being made into an emulsion, or they may be rubbed up with yolk of egg.

The powdered gum and water, or mucilage, should be measured into a mortar, and the oil gradually added, with continual *light* rubbing, the pestle being always moved in the same direction, more oil being put in only after the first added has been blended with the water. Generally speaking, there should be as much oil as watery fluid at this stage.

If the mixture gets too thick during the rubbing, a little water may be added from time to time to thin it; and when all the oil is thus incorporated, the mixture is poured into the bottle in which it is to be dispensed, and any other ingredients prescribed, are to be very cautiously added, each freely diluted before being poured in, tinctures or spirituous liquors always being added *last*, in very small quantity at a time, and diluted; neutral or acid salts, if ordered, must be very cautiously added, as they run a fair chance of spoiling the union of the oil and water, but many alkaline salts strengthen it.

The object of the dispenser should be to cause minute division of the particles of the oil, and to get each minute particle covered over with a film of mucilage or albumin, which prevents its uniting again with neighbouring globules.

Some dispensers put the powdered gum or mucilage into the bottle with a little water, adding gradually the oil, with brisk shaking; such a plan is not to be recommended. Alkaline emulsions may, however, be prepared in this way, and it is the way in which copaiba is generally treated; the alkali, commonly solution of potash, mixed with as much water as there is balsam or oil, is put into the bottle, the balsam added, and after brisk agitation complete incorporation will be effected, the bottle being gradually filled up and thoroughly shaken upon each addition of the watery menstruum. The balsam or oil is often weighed into the dispensing bottle, containing a portion of the emulsifying agent and some water, and this is the most correct method; but it should be remembered, if a *perfect* emulsion is desired, this plan should not be followed, as the oil or balsam adheres so firmly to the sides that globules will always be floating to the surface after the dispenser thinks that all is safe. This may be obviated by pouring the emulsion into another clean bottle, after all the ingredients have been added.

Tincture of senega in small quantity has the power of emulsifying fats and oils very efficiently. 5 minims will emulsify $\frac{1}{2}$ ounce of fixed oil.

Tinctura quillaia possesses the same power, and is much used for making emulsions.

The mixture, having been compounded and put into the bottle in which it is to be dispensed, should be corked, and this must be done with care, as there are few things impress the patient so unfavourably as a cracked, soiled, or badly-fitting cork; the dispenser should take the measure of the neck of the bottle with his eye, before fitting the cork, and once it has been tried in the

bottle it should not be put back amongst the others into the drawer, but regarded as a *soiled* cork. It is the custom to seal over the top of the cork with wax ; coloured paper, leather, or tinfoil may be used ; if leather is used in tying over a bottle it should be very thin, and put on quite wet, and without a single crease ; it makes the most elegant finish, but is not commonly used. Labelling should be done with the most scrupulous neatness and distinctness, all flourishes being condemned. The margins of the label should be carefully trimmed, and a new label should not be put over an old one. A mixture should never reach a patient without being checked with care, when possible, by a second person, and most chemists affix a small label bearing the initials of the compounder whose duty it is to check the work.

CHAPTER III.

MIXTURES.—*Continued.*

It might not be out of place here to refer to a few of the difficulties in mixture making which the student may expect to meet with. The following may be taken as examples :—

Quinine Sulphate in the form of a mixture is one of the most frequently prescribed drugs in the Pharmacopœia. Sometimes it is prescribed in combination with a little flavouring syrup and water, without any acid for its solution—and the officious dispenser occasionally falls into the error of adding sulphuric acid to effect its solution. This is a mistake. The quinine should be rubbed up in a mortar with a little water, or added to the vehicle in its crystalline state, with directions that the bottle is to be well shaken before each dose is poured out.

When an acid is prescribed for its solution, the careless dispenser may drop the quinine into the concentrated acid previous to dilution with the vehicle or water, and a new sulphate is formed, which is only sparingly soluble. The acid should be freely diluted before the alkaloid is added.

Or quinine may be ordered with tinctures, spirit of nitrous ether, or other spirituous liquids along with glycerin or syrup and water. In this case the alkaloid may be dissolved in the concentrated spirit, and the watery portions *gradually* added after the glycerin or syrup, so that if the mixture be not too dilute, a clear solution, instead of a muddy mess, may be presented to the patient.

Or quinine may be ordered with sulphuric acid and tannin, or some vegetable containing tannin, when a precipitate of tannate of quinine is the result. The dispenser should not fall into the error of filtering this latter out of the mixture. The custom of

prescribing sulphate of quinine should be abandoned by the physician, since the soluble hydrochloride and acid hydrochloride answer all purposes perfectly, and require no solvent acids.

Alkalies—Aromatic Spirit of Ammonia, Carbonates, etc.—are incompatible with quinine salts, the alkaloid being precipitated. Great care is necessary in compounding mixtures containing these ingredients. They should be well diluted before mixing, and should be thoroughly shaken. A “shake-the-bottle” label should be put on the finished mixture. In a prescription of this sort the physician would help the chemist greatly by including a little mucilage in his formula.

Salicylate of Sodium, or Salicylic Acid, is occasionally ordered in a mixture with quinine, and the dispenser will find that a disgusting-looking semi-solid mass forms in the bottle, and refuses to pour out. This latter case he should regard as one of absolute incompatibility, calling for a consultation with the prescriber. If this is impossible, matters may be partially remedied by adding mucilage to the quinine, and gradually mixing in the salicylate, dissolved in a large quantity of water, and shaking briskly.

Scale Preparations when ordered in a mixture should either be dissolved in a clean mortar, with warm water, or poured into the bottleful of the vehicle and agitated; if put into the dry bottle, and the water or vehicle added afterwards, a sticky, almost insoluble mass cakes at the bottom.

Vegetable Extracts when prescribed in mixtures should be most carefully rubbed up in a *slightly* warmed mortar, with a little water, until a soft cream results, to which the vehicle is to be gradually added. If the extracts contain resinous matters mucilage should be added by the prescriber.

Turpentine, or **Terebene**, will give the dispenser some trouble. If the emulsifying agent is left in his hands, he can make a good mixture with yolk of egg. It will require one egg at least for each ounce of turpentine. This applies to most ethereal or essential oils. Thick mucilage answers, but not so well. Turpentine has been successfully combined with a watery vehicle by rubbing it up in a mortar, with about 2 per cent. of powdered Castile soap, adding the watery vehicle gradually, and shaking briskly.

Almond Oil emulsifies unsatisfactorily with mucilage or powdered gum. A small quantity of liquor potassæ or potassium carbonate answers well, whilst a mixture of either of these with mucilage spoils an emulsion containing almond oil.

Cannabis Indica, **Castor**, **Guaiacum**, or other resinous tinctures, when ordered in the form of mixture, with directions for the use of an emulsifier according to the dispenser’s fancy, will give

some trouble. The best plan is to use a quantity of thick fresh mucilage, rather more than equal to the quantity of the tincture, which must be added only after dilution with water.

Borax, powdered and rubbed up with mucilage, forms a soft powder, like moist sugar, which cannot be made liquid by the addition of any further quantity of mucilage, and acetate of lead, similarly treated, makes an opaque white jelly.

Spirit of Nitrous Ether will generally require to be neutralised with potassium carbonate before being compounded with potassium bromide or iodide, otherwise free bromine or iodine will be liberated, and the mixture darkened, and a somewhat dangerous compound will result.

Bismuth Subnitrate is often ordered in a mixture with sodium bicarbonate, and unless very great care is taken in compounding them, by permitting decomposition at a gentle heat, carbon dioxide will be produced, and the bottle will burst. This may be prevented by using an equivalent quantity of the bismuth carbonate, with the prescriber's sanction.

Liquid Extract of Male Fern is generally ordered to be rubbed up with milk, fresh mucilage, or tragacanth, but egg will be found a better emulsifier (see the formula under *Filix Mas* in the therapeutic section of this volume).

Tincture of Tolu, Friar's Balsam, or Tincture of Myrrh, may be easily added to cough mixtures, when a small quantity of powdered tragacanth is ordered at the same time, and though the scrupulosity of the dispenser in closely following the letter of his prescription is to be admired, still if gum were added sometimes on his own responsibility, the unsightly messes which are presented to patients either through the oversight or ignorance of the physician would be greatly improved. Sometimes the relations which exist between the physician and the dispenser will quite justify the latter in making an alteration, but it is a dangerous ground, and he must always hesitate before interfering, unless where there appears a very evident necessity. Each case must be considered on its own merits, and no rule can possibly be laid down for the guidance of the young dispenser.

A Draught is a small mixture which is to be swallowed at one dose; it generally contains $1, 1\frac{1}{2}$, or 2 ounces, and is compounded and dispensed in every way like a mixture.

Liniments or Embrocations, Sprays, Injections, Lotions, Collyria or Eye Washes, and Gargles, are compounded in the same way as mixtures, and the dispenser will have no difficulty with them.

All poisonous external applications should be dispensed in differently shaped bottles from those used for mixtures; the blue glass hexagons with three fluted sides are by far the best for this purpose, and less likely to be mistaken for mixture

bottles than any other. This is now rendered obligatory by the Poison Regulations (Pharmacy Act). Strong liniments, in addition to bearing the words, "For external use only," should be marked "Poison." Most chemists now supply labels for these printed upon a bright orange or other strongly tinted paper. Injections, mouth washes, or unusually strong gargles, should be marked "Not to be taken."

A Linctus or Lincture or Loch literally means any medicine of such a consistence that it has to be licked or lapped off a spoon. They are seldom prescribed, and when the dispenser meets with them he mixes the ingredients together as for an ordinary cough syrup or confection, and dispenses them in a plain bottle, or if too viscid for flowing, he puts them into a wide-mouthed bottle or ointment pot.

Electuaries, Conserves, or Confections, are mixtures of a pasty consistence, like jam, and generally containing powdered substances made into a soft mass with treacle, syrup, honey, etc. The substances prescribed in this form, if not already in fine powder, must be reduced to this condition and sifted; sulphur, rhubarb, jalap, ginger, and magnesium sulphate are occasionally ordered in this manner. The powders should be carefully triturated in a large mortar, and when thoroughly mixed the saccharine substance should be gradually added till a smooth, uniform, and impalpable paste is obtained. The powders should never be stirred into the treacle or honey, but the latter should be poured in upon the powder, and when compounded, the confection, if very soft, should be dispensed in a pot in which there is plenty of room for stirring up. If magnesium sulphate is ordered, the dispenser may use the dried salt, allowing for its extra strength, as it is almost impossible to pulverise the ordinary drug.

CHAPTER IV.

THE COMPOUNDING AND DISPENSING OF POWDERS.

THE physician may order substances to be dispensed in this form which are not kept in the powdered condition by the chemist, and the dispenser will consequently be obliged to pulverise them. This is done on the small scale by using a mortar like the one in Fig. 5; the pestle is grasped in the same manner, but wielded very differently; it is raised and lowered in a quick or jerky fashion for a few inches, and in a straight up and down motion from the elbow, each stroke being aimed at a particle, which is thus crushed between the end of the pestle and

the bottom of the mortar. When the coarser pieces have disappeared, the pestle is to be used as in the figure, and the powder ground between the sides of the mortar and the end of the pestle till the required fineness is obtained. The mortar for such an operation should be of wedgwood, and not too highly polished, as the roughness of the interior surface greatly facilitates pulverisation.

If the substance to be powdered for a prescription happens to be a root, or leaf, or herb, which is rare (as such are almost always kept powdered in stock), then an iron mortar with a lid is to be used, for any considerable force should not be employed with a wedgwood or porcelain pestle. After the grinding has been performed till single particles are no longer visible to the naked eye, the powder should be passed through a fine sieve, and for very small quantities it is sufficient to extemporise a little sieve by stretching a piece of fine muslin over a large chip ointment box, out of which the bottom has been knocked, and securing it with a string or tight hoop like a drum head.

The bulk of a powder varies. Generally prescribers order not more than 20 to 40 grains, often about 5 grains are prescribed. If only one powder is to be sent to the patient, it is simply weighed on the scale and placed upon a piece of paper, and, if containing more than one ingredient in a single powder, these should be carefully mixed on the paper with the point of a knife, for though the patient is to swallow the entire powder without division, and its mixture is practically of no importance, it looks careless, and does not impress him favourably on being able to distinguish different shades of colour in what he is about to take. Powder papers should be glazed, and for small powders, about 4×5 inches is a convenient size. Different shades of colour are used and some even prefer the paper unpolished. As a rule, paper such as is used for writing on is suitable. The white glazed demy, manufactured specially for the purpose, and sold by druggists' sundrymen, is the best powder-paper. It may be had cut in different sizes. To fold a powder requires a good deal of care and practice, and once learned it is never forgotten, and is useful when applied to many other little opera-

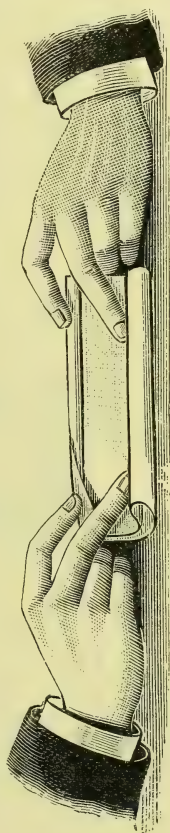


FIG. 7.

tions. Though so simple, it is, however, a difficult task to describe in writing.

The following is the old-fashioned way of folding a powder :— The powder being placed on the centre of a paper, which lies flat on the counter before him, the folder seizes the margin farthest from him between the second finger and thumb of his left hand, at the same moment seizing the near margin with the corresponding fingers of the right hand ; he brings them together, their edges looking directly upwards, only the edge of the margin nearest is half an inch higher than the edge which is farthest off him (Fig. 7). The margins are held in this position with the second finger and thumb of each hand, while the folder turns down in a flap with his index-fingers the upper margin over the lower. (The figure shows this turning down as having commenced at the right-hand corner.) The flap thus

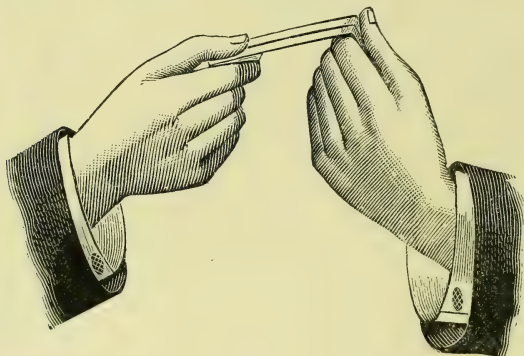


FIG. 8.

produced is turned over upon itself, which finishes the folding process, except the bending down or in of the ends, which is done, as Fig. 8 describes, by simply bending them between the finger and thumb, or by creasing over a powder-folder made for the purpose, which secures all the powders being of exactly the same length. Some dispensers bend down the ends over a flat-bladed knife. After the powder is thus folded its appearance is much improved by passing the blade of a spatula or ivory paper-knife firmly and rapidly over it, removing every crease, and preventing the mass of powder causing a bulging in the middle. This is always necessary when the powder weighs more than a scruple, and it is especially necessary when any considerable number is ordered to be dispensed in a box or envelope. Care is requisite in passing the spatula over bulky powders to keep the blade perfectly flat or horizontal, as otherwise

its edge will readily tear through the paper. Very large powders, containing substances like Rochelle salt, sulphur, etc., can be uniformly flattened by striking them gently several times with the handle of the knife before passing the blade over them.

Pharmacists, however, nearly universally fold a powder in this way :—The dispenser places the paper before him on the counter or table with the powder in its centre, and brings the border of

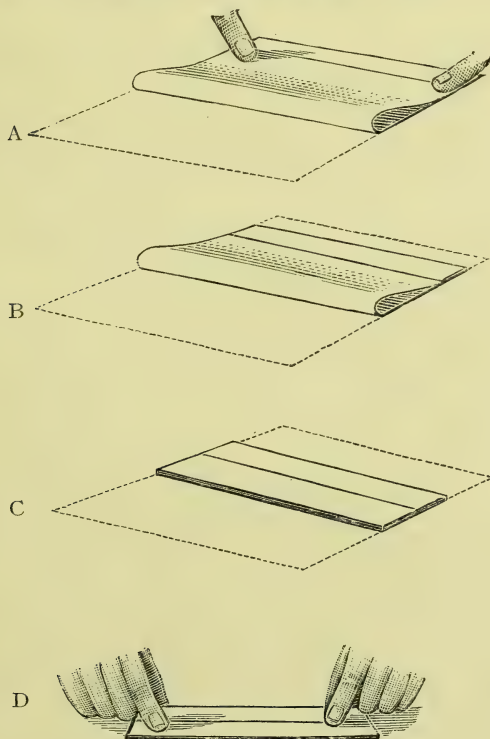


FIG. 9.

the paper farthest from him to within half an inch of the border next him, he secures it in this position with his index-fingers, whilst with his thumbs he turns the half-inch of margin of the paper next him in a flap over it. This is again folded over on itself, which completes the folding (Fig. 9), the ends being turned down, as in the first instance, by the fingers, over a knife or on a powder-folder.

A represents the farthest edge brought towards the folder ; in B the edge next him is turned over in a flap upon this ; in C and in D both are together turned over in a second flap ; and the folding is completed except the turning back of the ends. The dotted lines show the space originally covered by the paper. In this method the powder is technically said to be folded " to " the dispenser. More commonly, however, it is folded " off " him, and this is the proper way, only it is more difficult to accomplish it for the first time. It is done precisely in the same way, except that the near edge of the paper is brought to within half an inch of the farthest edge, which is turned over on it, and again both are turned over as before.

The following still simpler method of folding a powder may be easily mastered by the student :—He places the paper before him with the powder in its centre, and turning back into a flap about half an inch of the margin next him, he smooths it down flat upon itself. Into the crease of this flap he inserts the edge of the paper farthest from him, and bends both over exactly as in the two previous instances, and finishes the ends as before.

The first method is the most difficult to accomplish, but it is the best, as by it the dispenser folds large bulky powders, like magnesia, Gregory's powder, Rochelle or Epsom salts, etc., which cannot be properly folded otherwise. Suppose 1 ounce of the sulphate of magnesium is to be dispensed in a paper, the dispenser weighs it out on a paper, and proceeds exactly as in the first instance of folding a small powder, as in Fig. 7. He does not, however, fold back the ends over a folder, but gathering in loosely the left end, he closes it so that the packet can stand upon it, like an upright cylinder open at the opposite end. Into this end he inserts his right index-finger, and folding the paper round it, he withdraws it, causing the end to retain the creases into which it falls. He then bends down the folded-in flap, and undoes the end upon which the packet was standing, which now goes through the same process as the right end, after shaking down the contents and making the surface even. Practice only will enable the dispenser to fold a packet in this way, as it is impossible to clearly describe it in a book. The little time lost will be amply repaid by the education which the fingers receive.

If more than one powder be ordered, the dispenser proceeds in a different way. Suppose, for example, twelve 5-grain Dover's powders are to be dispensed, two ways are open to him. First, spread twelve papers out on the dispensing counter in four rows of three each. Weigh 5 grains, and place them on each paper till the dozen powders are weighed out. Then begin to fold one after another till all are finished. This is a tedious plan, for which the expert and experienced dispenser sometimes substitutes the following :—Weigh 60 grains, place it on the centre paper, and divide the heap with a knife into twelve portions, now

adding a little to one and taking some from another, till the *eye* is satisfied that all are equal ; or, till a little practice is obtained in this method, weigh out 30 grains twice and divide each into six papers. It is surprising how the eye so soon becomes educated to discriminate small differences in the size of the powders. This method, however, is not applicable to large powders, and should only be practised after very considerable experience of weighing ; the writer cannot recommend it, especially to the student, and it is condemned by high pharmaceutical authority.

Ordinarily, in prescribing powders, the medical man writes the form as if for one powder, and then directs, say, twelve such to be sent ; hence twelve times the quantity of each substance is weighed and put into a mortar, generally in the order in which it is prescribed, for, as a rule, it matters little in what order the ingredients are mixed, provided they have been previously in a state of fine powder.

If a very small quantity of an active ingredient be prescribed, it should first be put into the mortar with about twice its bulk of some of the more inert ingredients ; and after careful trituration, using the pestle as shown in Fig. 6, the remaining substances are gradually added. Substances which are not in powdered form should be first rubbed down finely, and then mixed with the other ingredients. The mass of the powder should not be divided until the most thorough admixture has been accomplished.

Should a drug, *e.g.*, potassium bromide, be ordered as a powder it is desirable to pulverise it, so as to remove its obvious crystalline structure, in order to destroy its identity, and not have it sent out to the patient in crystalline masses.

Sometimes the physician orders a certain weight of the different ingredients to be mixed and *divided* into a number of powders. Here the dispenser might make a terrible mistake if he multiplied the quantity by the number of powders instead of dividing, and he should be always on his guard against such an accident. Substances which are perishable, as ergot, are sometimes ordered to be dispensed in this form ; or substances which are volatile, as camphor ; or deliquescent, as carbonate of potassium ; or liable to chemical decomposition, as sulphide of calcium, or the valerianates ; in which case they should be folded up in the ordinary paper first, or, preferably, in waxed paper, and then each one covered with tinfoil, and sent out in packets of four or six, which are again covered with an extra piece of the foil, and if to be kept for any time they should be enclosed in a wide-mouthed bottle.

Sometimes a powder like Gregory's, ginger, soda, rhubarb, etc., is prescribed in quantity, with directions for a teaspoonful or other dose ; or powdered borax is prescribed for injecting. In such cases the dispenser should send it to the patient in a wide-

mouthed bottle, well corked, or even in some instances in a bottle with a glass stopper.

When as many as six or eight small powders are ordered they should always be folded exactly of the same length on a folder, and sent in a cardboard box. Numbers under this are generally dispensed in small oblong envelopes, made for the purpose, and on which the directions can be written like the address on any ordinary letter. If sent in a box or bottle, a small label is gummed on the outside.

CHAPTER V.

COMPOUNDING AND DISPENSING OF PILLS.

THE making of a perfect pill mass is a delicate and difficult operation, generally requiring much care and patience, as well as a considerable degree of practical experience. It will give the compounder much more trouble than the simpler processes already described, owing to the complexity of the process through which the mass has to pass before the finished pills are in a proper condition to be presented to the patient, and partly also because he is often left completely to his own resources to unite in a pilular form ingredients unsuitable and without any cohesive property. Pills should be perfectly spherical, and should not be larger than can be readily swallowed without chewing; each should not exceed 4 or 5 grains in weight, unless the ingredients are exceptionally heavy—as calomel, bismuth nitrate, reduced iron, blue mass, etc.—when 8, 9, or even 12 grains may be with skill compounded in a fair-sized pill. On the other hand, as small a quantity as 5 grains of a light vegetable powder will be sure to make too bulky a pill, as the weight of the excipient or material added to give body must be taken into account. The choice of the excipient is often left to the dispenser, and some experience is necessary to guide him in his selection. The most common are: gum or mucilage, soap, syrup, spirit, glycerin of tragacanth, or some soft extract, as gentian, inert in very small doses.

Mucilage, a commonly used excipient, is well adapted to make vegetable powders into pills, but, as a rule, its use should be restricted to pills that are soon to be consumed—otherwise they will get very hard and almost insoluble. For mineral powders it is not so suitable, as the pills made in this way are apt to flatten, or “fall.”

Tragacanth is a very good excipient; in the form of the compound powder it is especially so when added to masses which are already too soft, as it gives body and elasticity; but if used

too freely, the pills retain the cylindrical form, and after a short time may lose all trace of rotundity. Tragacanth and water give good consistence to substances like nitrate of bismuth. (Upon page 26 Proctor's Paste is described.)

Glucose first recommended by Mr. Lascheid is now used in the present British Pharmacopœia as an excipient for many of the official pill masses in the form of syrup of glucose.

Glucantha is the name given in the pharmacopœia of Guy's Hospital to an excipient consisting of 240 grains powdered tragacanth, $\frac{1}{2}$ ounce water, and 2 ounces syrup of glucose. Some authorities prefer, however, to make this excipient with $3\frac{1}{2}$ ounces pure glucose and add $1\frac{1}{2}$ ounces glycerin to the above quantities of tragacanth and water.

Theriacaantha is the name given to an excellent excipient made by substituting treacle for syrup of glucose in the above.

Honey and Treacle are used in preference to mucilage of acacia, as they make nearly as good a body, but with less risk of becoming hard.

Tincture of Gentian and Treacle, equal parts, make an excellent excipient, giving firmness and toughness, and ensuring solubility. It is particularly suitable for quinine.

Syrup is used for the same purpose when very little room is left for the excipient, but it makes crumbly masses with metallic salts.

Soap makes an excellent pill when added to resinous substances ; it does not get hard, and is not apt to crumble, unless a substance like sulphate of iron be added.

Spirit is used in working up resinous substances ; it is, however, very difficult to work with, as there is great danger of adding too much, which causes the mass to "drop," and if too little be added no effect is produced at all.

Decoction of Aloes.—A very few drops of this liquid make a workable mass with aloes and gum resins. Care must be taken that the mass contains no substance which is incompatible with the carbonate of potassium in the decoction.

Kaolin is of great use in making a mass with substances which ordinary excipients decompose, as Pot. Permang., Argent. Nit., etc., and then adding a fat like lanoline. Kieselguhr is employed in the same way.

Liquorice and Marshmallow in powder give elasticity to soft masses.

Glycerin in very minute quantity occasionally assists dry crumbly masses ; it is treacherously hygroscopic, but this difficulty is overcome by mixing with it one-third of its bulk of water.

Glycerin, Mucilage of Acacia, Syrup, and Alcohol (90 per cent.), in equal parts, make a good all-round liquid excipient.

Wax melted or in shavings makes a beautiful mass with creosote, camphor, carbolic acid, and most essential oils; it, however, makes an indigestible pill, and is not to be recommended.

Water is a dangerous excipient to use except in cases where a powdered gum is present, as it forms a brittle pill liable to flatten. It is excellent for making powdered opium into a mass, which is too often made into a pill by the addition of mucilage of acacia, with the result that the pills after a time become almost insoluble in the intestinal tract.

Breadcrumb for croton oil and carbolic acid, **Basilicon Ointment** for the scale preparations, **Confection of Roses** for vegetable powders, are deservedly little used now.

Calcium Phosphate is recommended in small quantities to give pilular consistence to greasy substances.

The dispenser will see that he has a long list of excipients, but a little experience will soon teach him that when he gets to *know* an excipient he can do almost anything with it; and most pill-makers have their favourite.

Proctor's Paste.—The writer, in recommending an excipient for *general purposes*, believes that none can be found equal to a paste made of—Powdered tragacanth, 1 drachm; glycerin, $3\frac{1}{2}$ drachms; water, 1 drachm.

It improves by keeping. The inexperienced dispenser will be amazed how little of this substance will be sufficient to give consistency, toughness, and retentiveness to the most unpromising mass. The new B.P. glycerin of tragacanth may be used instead; it has almost the same composition.

The dispenser, having read over the prescription, and thought of the excipient which he will use, if such is not already directed by the physician, proceeds to weigh out the different ingredients, taking the substances that require pulverisation first; when all the dry ones are thoroughly mixed, the soft extracts are added, and the mass worked up in a mortar.

The proper mortar is figured upon the following page (Fig. 10). It is very shallow, there being one mortar or shallow depression generally in each end of it; it should be of unpolished wedgwood ware, and very thick, with a long, though small pestle—which is to be worked in a totally different way from any yet mentioned—the pestle being used as a lever, with the edge of the mortar next the operator as a fulcrum; and great force is necessarily applied, in order to squeeze the substance between the end of the pestle and the side of the mortar at each slow stroke, the mortar being firmly grasped by the left hand and turned round occasionally, so that all parts of the pill mass are

exposed to the action of the pestle. By vigorous manipulation the heat produced by the friction so softens the mass that less excipient is necessary to produce a workable pill. It will thus be seen that the process is one of squeezing or kneading rather than pounding.

The student will do well to review at this place the different methods of using the mortar and pestle, as required for different results, and a little reflection will teach him more than a year's blind practice, for unless he has some idea of the scientific action of the machine, he can scarcely chance to wield the pestle efficiently or gracefully. It is used in at least four different ways :—1.—(As shown in Fig. 5.)—The pestle is grasped firmly, the wrist and elbow-joints kept almost rigid, while the pestle is



FIG. 10.

made to traverse the sides and bottom of the mortar, all the motion being at the *shoulder* joint (circumduction). 2.—The pestle is grasped in the same way, the wrist and shoulder joints are fixed, while the fore-arm is raised and lowered alternately—as a gold-beater uses his mallet—all the motion being confined to the *elbow* joint (Fig. 5). 3.—The pestle is grasped like a pen, and with a light, quick, easy motion at the *wrist* it sweeps round the inside of the mortar (Fig. 6). 4.—The pestle is grasped by the fingers, the expanded end of the handle being firmly planted against the centre of the palm, its middle resting against the inside edge of the mortar, when the three previous movements are executed, and the pestle is driven slowly and forcibly against the opposite side of the mortar—the pill mass being between—

here *shoulder, elbow, and wrist* are vigorously in motion (Fig. 10).

The ingredients being worked into a uniform stiff mass in the mortar, are to be scraped out, if necessary, with a small stiff spatula, and it is a good plan to work the mass for a few minutes between the fingers, in order to soften and toughen it. It is next rolled into a ball or cylinder with the finger and thumb, and transferred to the slab of the pill machine, on which may be dusted a little finely-powdered French chalk, starch, or lycopodium; the back of the handle of the machine is used to roll it into a long cylindrical form (the pipe), great care being required to prevent the cylinder tapering out thin at either end; a very light and quick motion backwards and forwards will prevent this—the handle being held perfectly horizontal as shown in the sketch (Fig. 11), and each hand bearing an equal weight on the mass as it is rolled backwards and forwards over the slab. It

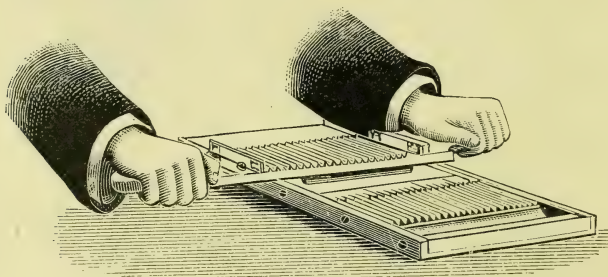


FIG. 11.

is brought from time to time alongside the scale, and when the number of pills into which it is to be divided corresponds with the number marked there, it is gently lifted or rolled with the fingers on to the grooved part of the machine; the handle, with its grooved surface downwards, is laid on it, and by a series of rapid and short movements (with both hands) abruptly brought to a close by pushing the handle from the dispenser, at the same time turning it on its own axis in his hands, the cylinder is cut and rounded into globular pills, which, with the last motion, are pushed into the box or tray at the end of the machine. If the operation is successful, and the mass of good consistence, no further handling will be necessary; but generally the track of the machine will be visible on each pill, and another process is required before the smooth globular form is perfect. The pills are again placed on the dusted slab, and covered with a pill-finisher—which is only a circular shallow boxwood tray, not so deep as the pills—and by a series of rapid rotatory move-

ments the traces of the machine are dispelled, and a more spherical and polished appearance is given (Fig. 12).

If the pills are very soft this cannot be successfully done, but they must be rounded separately between the finger and thumb.

There is another and more convenient method of making pills in small quantities ; it is by means of the graduated tile

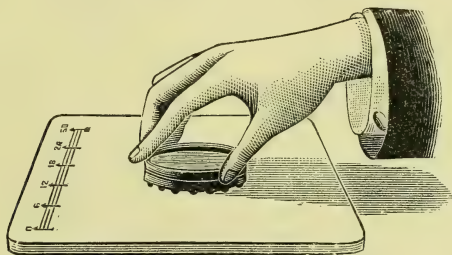


FIG. 12.

and a spatula. The ingredients are weighed and placed on the tile—which is of porcelain or wedgwood ware, with very little glaze on its surface.

With the square end of a stout spatula, technically called a spud, the mass is worked into a uniform consistence, and, after a little kneading with the fingers, it is rolled out between the

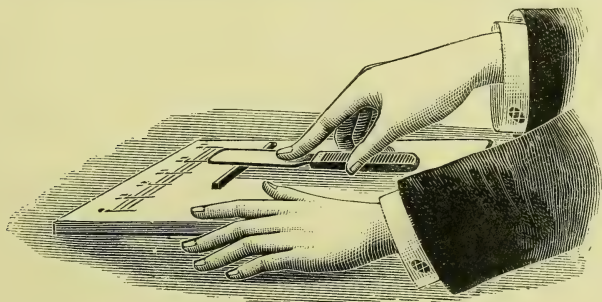


FIG. 13.

blade of the knife and the dusted slab, brought to the scale and cut into pieces, which are rounded into pills between the thumb and next two fingers of each hand. Fig. 13 shows the rolling out process. Or the mass may be made in the pill-mortar, and transferred to the tile, where it can be rolled out and cut.

By submitting the tile to a uniform heat—viz., by immersing in hot or boiling water and rapidly drying, hard masses which could not be otherwise brought into the pilular form, can be easily softened by kneading between the end of the spatula and the heated slab. In this way also small quantities of soft extracts can be dried or hardened by being spread out in a thin film on the *warm* slab, but great care is required lest the active principle of the extract be injured by the heat and exposure. Some pharmacists prefer a tile made of metal.

Machines are now made on the cylindrical roller principle, by which as many pills can be prepared in an hour as the old-fashioned machine could turn out in a week, but they are only useful where very large quantities are to be rolled out at once.

The pills having been prepared as described, should be left out to dry (unless urgently required), either on the slab of the pill machine, or in some dry and warm place, whilst the label is being written and the box prepared in which they are to be dispensed. The box should be large enough to hold them in a single layer, otherwise they will be liable to stick or become flattened. Pills containing volatile ingredients should be always dispensed in a bottle, of which there are many kinds manufactured for the purpose with wide mouths. If uncoated, some powder must be put into the box or bottle to prevent them adhering to each other or to the vessel, and different dispensers are in the habit of using different powders for the purpose. Chalk, lycopodium, flour, liquorice, etc., are used; powdered French chalk will probably be found to be the most elegant and efficient.

CHAPTER VI.

PILL MAKING.—*Continued.*

ALL first-class dispensers have discarded the old-fashioned powder, and now send out their pills with a smooth, firm, polished coating on them. Perhaps the most general coating is French chalk or talc, either alone or sweetened with sugar or saccharin. Sugar alone is also employed, but it requires more practice to be proficient in its use. Albumin is occasionally resorted to, and the same may be said of coating with silver leaf; this was the favourite method prior to the introduction of pearl coating, which is the name sometimes given to coating with chalk. Gold-leaf is now very rarely used as a covering for pills. Gelatin is frequently employed, and often a physician orders keratin-coated pills. Yet another covering for pills is varnish composed of tolu, sandarach, or mastich (or a combination) dissolved in ether. This last process tends to render

the pills insoluble, and is only here mentioned in order to be condemned.

Whatever the coating employed, the pills should be hard, else discoloration occurs either from saturation of the white coating with moisture from the coloured pill substance, or by reaction between the ingredients of the mass and the silver leaf.

Frequently, and this is especially so in extemporaneous pharmacy, pills cannot be kept in shallow trays to harden, and, as a consequence, the plan is sometimes adopted of giving a coat of varnish, and, as soon as that is dry, to proceed with the pearl or other coating. Such a practice is not to be advocated as it renders the pills insoluble.

Pearl Coating.—On the small scale as practised in extemporaneous pharmacy, splendid results can be obtained by the following process:—Having cut and rounded the pills, they should receive a covering of mucilage of tragacanth or of acacia (the former is preferable, producing a whiter coat) ; by transferring them to the palm of the left hand, a drop of the mucilage is placed on the ball of the thumb, and with one finger of the right hand the mucilage is applied to each pill. By this plan the quantity can be accurately gauged, whereas by pouring the mucilage on to the pills the covering is not so likely to prove evenly distributed. Having received the coat of mucilage, they are thrown into some talc, which has been placed upon one compartment of the pill rounder (the other is kept perfectly clean). The rounder is then gently revolved in its own plane, care being taken to separate any pills which adhere to one another. By this means the coat is applied evenly over each pill. When they cease to take up chalk they are transferred to the clean portion of the rounder, where they are polished. The best method of doing this is to place over them a piece of glazed wrapping, or silvered paper, and with the finger tips placed over the paper the pills are rotated, and a brilliant polish is thus given to them, care being taken to keep the paper between the tips of the fingers and the pills during the process, and to use only light pressure. The polish will be permanent if time permits of the pills being allowed to dry in a tray for ten or twenty minutes, provided that sufficient moisture has not been present in the mass to discolour the coating. It is sometimes necessary to give a second coating, but practice will enable the pharmacist to judge of the consistence required to obtain desirable results, and of the amount of mucilage and chalk needed.

Instead of the above process, the pills may be moistened with mucilage in a shallow, flat-bottomed dish, and transferred to another dish containing talc, and the polishing carried out by finishing them on a polished slab with the rounder.

To give a more brilliant finish to pearl-coated pills, it has been suggested to very lightly roll them in a dish in which has been

melted a small quantity of hard paraffin, and then allow them to dry. This, however, is scarcely advisable. The admixture of starch (1 dram) with talc (1 ounce) gives a whiter coating than simple chalk, or the talc may be tinted by the addition of any harmless colouring agent.

In larger quantities other apparatus is generally employed. The pills are moistened with mucilage in a large covered pot, and then transferred to a "pill coater." The coater is used both to coat the pills and to polish them, or they may be polished on a slab with a rounder.

The process is the same if sugar or saccharin be mixed with the chalk.

It is hardly necessary to say that no loose powder should be put into the box or bottle in which coated pills are dispensed.

Sugar Coating requires practice before much success can be obtained. The *modus operandi* consists of moistening the pills thoroughly with syrup, or a mixture of syrup and mucilage, in a pill coater, carefully heating in a Bunsen flame, whilst the pills are constantly revolved, and powdered sugar added from time to time until a hard white coating results. Or if the pills be covered with a film of mucilage, syrup, or gelatin, and turned into a circular box containing finely-powdered sugar and starch in equal quantities, brisk circular movement for a few minutes is all that is necessary; the addition of a little finely-powdered tragacanth to the starch and sugar gives a more elegant finish. The process can only be successfully carried out when large quantities of pills are operated upon.

Silver Coating.—To properly coat pills with silver requires some neatness and care. The following directions, if followed, will give a successful result:—There should be no trace of powder about pills intended to be silvered. The silver leaf, as it lies flat in the book in which it is originally supplied by the manufacturer, is exposed, and each pill is rolled between the thumb and the next two fingers, which have been previously rubbed against a little mucilage dropped on the slab of the pill machine, and when a sticky layer is felt to be imparted to the pill, without being so abundant as to drop off or run, it is allowed to fall on the silver leaf, and another treated in the same way, till twelve or eighteen pills (according to their size) are dropped at equal distances apart on a single leaf.

The silver leaf with the pills on it is allowed to quickly slide off the book into a spherical, or egg-shaped, boxwood vessel, which is to be shaken cautiously, the hand containing the box being turned round, making a circle in the air, for about one minute, so as to cause the pills to run round its inside, when an even and lustrous coating of metallic silver will be seen adhering to and completely covering each pill. Any loose fragments of leaf can be blown away, and after a short exposure to the air on the slab,

the pills may be enclosed in the bottle or box in which they are to reach the patient.

Gold Coating.—Gold leaf may be applied in the same way as just described for silver coating. Pills containing blue mass in any considerable proportion should not be silvered, the mercury making an unsightly amalgam with the silver leaf. Asafetida, when coated, turns the silver black, and consequently gold should be used.

Gelatin Coating.—The general process is briefly :—Each pill is impaled upon the point of a needle, and dipped into a solution of gelatin (one of gelatin with four of water liquefied by heat). It is rotated in the air for a few moments and set aside to harden. When the needle is withdrawn its mark is closed with a little fresh gelatin. By employing discs of cork, metal, etc., with numerous needle points, pills can be expeditiously coated in this way.

Keratin Coating.—Pills are coated with keratin, as originally recommended by Unna, when the physician desires that they shall pass through the stomach undissolved, so that their effect may be produced upon the intestine, in the alkaline secretions of which they will become disintegrated. Keratin is obtained from horn shavings by treatment with pepsin and acid, dissolving the residue in ammonia solution, and evaporating until the consistence of mucilage is reached. The resulting solution is that used for pill coating. Only oily excipients should be used in making the pills, and Martindale recommends that they get a thin coating of cacao butter first, and then three coats of keratin solution, each coat, of course, being allowed to dry before the next is applied, by shaking in a pot or dish with the necessary quantity of solution, after which they are placed on a slab to dry. Salol made into a varnish with a small quantity of shellac, alcohol, and ether may be applied in the same way as a coating when the pills are not intended to dissolve in the stomach.

A **Bolus** is sometimes ordered in a prescription, as 10 grains of quinine may be prescribed by the physician, with directions for the dispenser to make it into a "bolus," with honey, treacle, syrup, or any thick fluid. In England such a dose is sent out to the patient in one large, firm pill; but often in Ireland, and elsewhere, the pharmacist adds a sufficient quantity of the liquid substance to make a soft paste, like a confection or linctus, which he encloses in a piece of waxed or oiled paper, folded like a powder, with directions that it is to be scraped off with a spoon, and bolted or swallowed like jam. It is at the best an inelegant and often disgusting form of administering medicine. The ordinary wafer papers, sold in circular boxes, afford an easy, elegant, and inviting method to the patient, whereby he can swallow the most nauseous powders, pills, or boluses, without

tasting them. The wafers are composed of flour and water, which become limp when wetted, and they can be readily wrapped around the nauseous morsel and swallowed as easily as a spoonful of pudding (see under Cachet Making).

The student will often find himself in a great difficulty as regards the compounding of pills, especially as no rules can be laid down for his guidance in selecting an excipient for every case. The following are a few of the difficulties, and their solutions, which he may meet:—

Strychnine or other powerful alkaloid is ordered in minute quantity, say $\frac{1}{32}$ grain. It should be rubbed up with a little sugar of milk crystals to fine powder, and after the addition of about $\frac{1}{4}$ grain of liquorice powder, Proctor's paste, extract of gentian or mucilage, will make a mass. The dispenser should have a rule of *making the gross weight of such pills up to 1 grain each*.

Aloes in any quantity in a mass is best made up on a heated slab with a *minute* quantity of proof spirit or decoction of aloes.

Butyl-Chloral Hydrate should not be treated with the tragacanth paste, which dissolves it and causes the pills to flatten. It is best worked up with a little confection of hips and thick mucilage.

Croton Oil makes a good mass with powdered liquorice and mucilage or with breadcrumb.

Camphor must be powdered after the addition of a few drops of spirit, and Proctor's paste added *after the spirit evaporates*.

Carbolic Acid may be easily made into a mass with $1\frac{1}{2}$ grains wheaten flour to 2 grains of the crystallised acid, or with breadcrumb, or with powdered marshmallow or elm bark, to which a trace of Proctor's paste is added.

Creosote is made into a mass by Martindale by adding animal soap, and heating on a water bath. Powdered liquorice, to which a few atoms of beeswax are added, affords a plastic workable mass. If prescribed in a pill with oxide of silver, creosote will explode unless the oxide be first diluted by trituration with some inert powder like liquorice or gentian.

Copaiba can be made into firm pills with a little carbonate of magnesium. They soon become insoluble. Phosphate of Calcium makes a better excipient.

Citrate of Iron and Quinine can be best quickly worked up with the smallest possible quantity of spirit and water, mixed in equal proportions.

Calcium Sulphide should be mixed with an equal quantity of sugar of milk, and, after careful trituration, as much powdered decorticated liquorice root added as will make the weight up to, say, a grain. The mass can now be worked easily with a

little tragacanth paste. Sugar of milk makes the best powder to aid the sub-division of an active substance, and the powdered decorticated root of liquorice is the best inert powder for making up pill masses, as it is so fine that it does not make a crumbly pill.

Extracts, when ordered without any powdered or dry substances, can be made into pills with gentian or liquorice powder.

Gallic Acid 5 grains (in fine powder) and glycerin $\frac{1}{2}$ drop make a good pill.

Iodide of Potassium should be rubbed up with a few drops of water into a smooth paste, and made into a mass with a little liquorice powder ; 6 grains may thus be got into a fair-sized pill. The proportions of liquorice and water will depend upon the sample of iodide, as this salt varies much in its suitability for making pill masses.

Phosphorus should be dissolved in bisulphide of carbon, and whilst solution is being effected two or three drops of chloroform may be added, which produce a heavy vapour around the solution and prevent oxidation of the phosphorus by the atmospheric oxygen. A little liquorice powder is now added, and the mass quickly made into a workable form with Proctor's paste, divided into pills and coated. Phosphorus is made into a pill by some pharmacists by melting it in cacao butter or mutton suet, and, when cold, beating it into a plastic mass, to which a little powdered liquorice may be added.

Quinine 8 parts, tartaric acid 1 part, with q.s. of Proctor's paste, make a mass much less liable to crumble and of less bulk than if the acid be omitted. They soon become insoluble.

Rhubarb Powder makes an elegant mass with one-fifth its weight of glycerin.

Tannic Acid can be manipulated with one-fifth its weight of glycerin and about one-tenth part of mucilage.

Permanganate of Potassium, in a pill, requires much care at the hands of the dispenser, as it yields oxygen in contact with organic matter ; it may be finely powdered and made into a mass with cacao butter and a little soft paraffin. Resin ointment makes also a good mass. Martindale advocates an excipient of soft paraffin, hard paraffin, and kaolin, whilst Proctor only uses kaolin and a little water.

Where the dispenser has the choice of an excipient in pills which are not to receive a coating of any kind, he should select an excipient which will not alter materially the colour of the mass ; thus quinine, bismuth, camphor, and all white substances should be made into a white mass when practicable.

CHAPTER VII.

CACHET MAKING.

A MORE recent method of administering remedies than any of the foregoing is the form of cachets, in which drugs are given in a powdered state, enclosed in a thin wafer paper cell. These are made of different sizes, which will hold from 1 grain, or less, to 20 or 25 grains. For the administration of nauseous or bitter substances, such as quinine, it is a very effective plan, and commends itself highly to physicians. The cachet machine, as figured, is made up of several pieces. The body of the

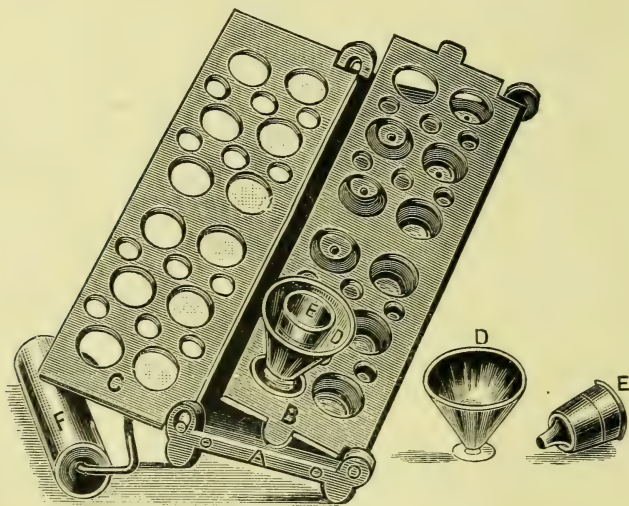


FIG. 14.

machine is composed of three plates on hinges (*a*, *b*, and *c*) which, with the funnel (*d*), thimble (*e*), and felt roller (*f*) for moistening the rims of the cachets, complete the apparatus. There are six sizes of cachets, which vary in depth and diameter, three different diameters being employed.

To describe cachet making, we will suppose a dozen containing 5 grains of quinine in each are ordered. The size numbered $0\frac{1}{2}$ is most suitable, and two dozens of the "cachet-leaves" are taken, half being put into holes in plate *c*, and the others into the corresponding depressions in plate *a*—the middle

plate. Plate *b* is now hinged over to cover plate *a*. The funnel on being placed in position rests on the edge of the hole in plate *b* so as to avoid pressing upon the cachet, and also to allow sufficient elevation of the powder when pressed in to fill the upper "cachet-leaf," when it is ultimately brought to cover it. Five grains of quinine are weighed, powdered, and placed in the funnel, and with the thimble (*e*) upon the index-finger the drug is pressed lightly downwards into the "cachet-leaf." The end of the thimble is concave, so that the surface of the contents is convex. This process is repeated until the dozen are finished. Plate *b* is now hinged off, and the filled half cachets or "cachet-

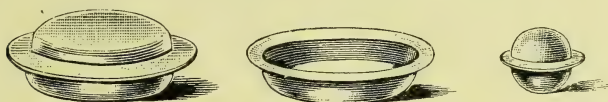


FIG. 15.

leaves" are ready to receive the others to complete the process. This next step is the one which requires most skill, for the application of moisture to the rims is important. Neither too much nor too little should be applied. If too much, the rims are likely to be damaged; if too little, they gape. To moisten the rims the roller (*f*) is damped by passing it over wet spongopiline, and then it is rolled over the rims of the half cachets in plate *c*, which is then hinged over and pressed upon plate *a*. The finished cachets are gently removed from the circles in plate *c*, and are dispensed in boxes.

Cachets can be obtained having much the shape of a spoon with a broad, short handle. When the drug is placed in the bowl of the "spoon," the handle is bent over and encloses it.

Fig. 15 show one cachet-leaf and two finished cachets.

CHAPTER VIII.

TABLET MAKING.

MEDICINAL AGENTS are now very frequently prescribed in the form of tablets, which are small biconvex discs usually containing about 5 grains of the pure compressed drug, mixed with the smallest possible amount of extraneous matter or excipient necessary to hold its particles together in the solid form. (The great majority of the 5-grain tablets in daily use and sold in the pharmacies are made up to weigh $6\frac{1}{4}$ grains by the addition of sugar of milk or sugar.) They are perhaps better known as

"Tabloids"—a term which, however, is the sole property of one large firm of tablet manufacturers who make a speciality of this department of pharmacy. The only official tablet is that of nitroglycerin, and does not fall under the above definition of a tablet, since each of them weighs 5 grains, the active ingredient weighing only $\frac{1}{500}$ part of the entire. The tablets for hypodermic injections are of minute size, and the excipients—sugar-cane or milk-sugar, chloride or sulphate of sodium, etc.—are scrupulously sterilised before being used.

The chief advantage of the tablet is its convenience over powders and pills in its portability, and in its property of preserving the drug in a soluble and unchanged condition for indefinitely long periods. It will be obvious that it differs entirely from the more bulky lozenge, which contains a large mass of inert basis which is intended to retard the solution of the active ingredient.

With the making of tabloids consisting solely of such drugs as antipyrine, phenacetin, sulphonal, quinine, salol, sodium salicylate, pepsin, grey powder, etc., the student or physician has little concern, since these preparations are procurable from every chemist, who purchases them direct from the manufacturers. Nevertheless, a brief general outline of the process by which substances like the above are made to assume the compressed tablet form will enable him to better understand the extemporaneous method to be adopted when any drug or combination of drugs is ordered by the physician to be dispensed as a tablet.

Substances in the crystalline state, like chlorate of potassium or chloride of ammonium, are very easily compressed into the tablet form. The first step is to reduce them to a moderately coarse powder, which is thrown into a very fine sieve in order to remove the impalpable dust-like portion which is rejected; the powder is next transferred to a No. 20 sieve, which allows only the moderately coarse granules or particles to fall through its meshes. This granulated powder is then transferred to the tablet machine without further preparation, and by a momentary mechanical compression is converted into a tablet.

Of tablet machines there are many, from the simple single punch and mallet to the complicated mechanisms driven by steam or electrical power, with their automatic mill-like hoppers or feeders supplying a continuous stream of the prepared powder, and turning out many thousands of the biconvex discs per hour.

For the dispensing counter M'Ewan's Pigmy machine answers all purposes; it consists of two heavy circular discs of polished steel, which can be accurately held together, the one on the top of the other, by a powerful screw and two dowel-pins. Upon the upper surface of the lower plate four shallow concavities of different sizes are scooped out, each of which constitutes

a half-mould or die of the size of the required tablet. The other half of the biconcave die is formed by the hollowed-out end of a cylindrical steel punch, which passes through an aperture in the upper circular disc exactly opposite the concavity in the lower one. The discs being screwed together, the necessary weight of prepared powder is poured down the circular opening in the upper disc, the closely fitting punch is inserted on the top of it, and two or three taps of a wooden mallet are sufficient to compress the powder into a compact tablet. There are four separate punches to correspond to the four concavities in the lower disc, so that the machine can be made to turn out several dozens of uniformly compressed and highly finished tablets per hour, in four different sizes. Another convenient machine constructed upon the same principle substitutes a lever for the mallet, so that by depressing a handle the requisite compressing force is more easily applied.

Most drugs require very careful manipulation before they can be submitted to compression. The first step is to get the powdered substance into a distinctly granulated condition, so that it may not stick to the punches or clog in the dies, and that it may flow freely through the hoppers of the larger machines. In order to secure proper granulation, the substance must be reduced to the finest possible powder, after which it should be triturated with some liquid substance in order that its fine particles may be made to cohere into minute granular masses. This may be accomplished by carefully moistening it with a little water or alcohol mixed with weak mucilage. A favourite moistening ingredient is the Theobroma Emulsion, introduced by Messrs. White and Robinson, which consists of oil of theobroma, 25 ; hard soap, 5 ; tragacanth, 5 ; benzoic acid, 25 ; and water to 100.

The fine powder is triturated with the above emulsion in quantity sufficient to moisten it, but not to make it too sticky : it should be able to pass through the meshes of a No. 20 sieve without rubbing ; after drying for several hours, the granulated powder is ready for transference to the machine. If the powdered substance be of a dry, dusty nature, a little glucose should be previously added, and if a diluent is needed, cane-sugar is the most suitable. Where time does not admit of the slow drying necessary when the emulsion is used, an ethereal solution of theobroma may be employed—*i.e.*, oil of theobroma, 1 ; ether, 6—to which an equal volume of rectified spirit is added before use. This method, as pointed out by Messrs. White and Robinson, proves highly suitable to drugs like aloes and other substances which form pill-like masses when moistened with water.

The compression of the granular powder, after having been prepared as above described, and weighed and placed in the die, is effected by a few light strokes of the mallet applied to the

steel punch, nothing else being required. But when powders have not been submitted to the action of the theobromine emulsion, some lubricant is often necessary in order to prevent the tablets sticking in the dies; the granulated powder is by some chemists sprayed over with paraffin solution; others effect the same result by mixing a little talc, boric acid, or starch in very fine powder with the granules. The use of a lubricant is more necessary in those automatic machines where the powder is made to flow through hoppers. The fine particles of many drugs like salicin, sulphonal, and phenacetin may be caused to cohere by the addition of a little cane-sugar, acacia, or starch, a lubricant like French chalk being added to prevent sticking to the dies or clogging in the hoppers. Grey powder should be mixed with sugar and moistened with mucilage of acacia. Calomel and opium may be advantageously diluted with sugar of milk and French chalk added as a lubricant.

It is needless to say that the punches and dies must be kept scrupulously clean and well oiled when not in use, so as to prevent the possibility of rust.

A little practice with the Pigmy machine soon demonstrates the degree of compressing force necessary to avoid cracking or breaking of the tablet. The finished product should be dispensed in a bottle or pill-box, and where the tablets are to be carried about in the patient's pocket a little cotton-wool may be inserted to prevent their rattling about and getting chipped by friction.

CHAPTER IX.

CAPSULE MAKING.

THE administration of medicines in the capsular form is daily becoming more frequently resorted to, as bitter, nauseous, and foul-smelling liquids can be swallowed in this form without the risk of exciting nausea.

Capsules containing liquids for inhalation like amyl nitrite, or for hypodermic use as solutions of adrenalin and cacodylate of soda, are preserved in capsules made of thin glass hermetically sealed. This form permits of the most thorough sterilisation of the liquid, and under the registered name of "Sterules" is largely used in ophthalmic work.

When the drug to be used in capsular form is intended for swallowing, the capsule is always made of gelatin. The B.P.C. basis consists of gelatin, 28; simple syrup, 8; glycerin, 20; water to 100, which makes a soft, flexible covering very suitable for most drugs. A harder basis is made by diminishing the proportion of glycerin and increasing the amount of syrup.

"The Art of Dispensing" suggests the following soft basis:—Gelatin, 30; glycerin, 15; mucilage of acacia, 7.5; water, 50. Empty capsules of hard gelatin are procurable from the wholesale manufacturers; these are so made in cylindrical form that one of them being filled with a powdered drug can be slipped inside its fellow, which is made a shade larger for the purpose. Sahli's glutoid capsules are made of formalised gelatin, which are only dissolved in the duodenum.

Powders like charcoal and the valerianates and soft extracts are sometimes prescribed in the capsular form, but the chief advantage of the method lies in the facility which it affords for the administration of oily and nauseous liquids. As the gelatin envelope is soluble in water, aqueous solutions cannot be enclosed in it, neither can liquid glycerin extracts be so administered. The liquid extract of male fern lends itself, however, to this method of administration, since it is really an oleo-resin.

Substances like creosote, carbolic acid, guaiacol, and even phosphorated oil, which have a strong local action on the stomach, must be diluted with some inert substance like liquid paraffin, almond or olive oil before being placed in the capsule.

The capacity of the capsule is obviously limited by the swallowing power of the patient, but half a fluid drachm of liquid enveloped in a soft gelatin envelope is as easily swallowed as a 5-grain pill, and some patients can readily swallow capsules of double this size.

The making of elegant capsules need not be restricted to the wholesale manufacturing firms; they can be extemporaneously compounded and dispensed by the chemist according to the prescription of the physician, to meet the necessities of each case.

The necessary appliances are simple. They consist of a series of olive-shaped moulds of different sizes, made of solid polished metal, each mounted upon a long metallic stem; a plate with a series of apertures or of egg-shaped depressions, in which the envelopes can rest during the filling process, completes the equipment. The moulds differ essentially from those used in the making of suppositories, where the melted material is poured into their hollow cavities. The solid oval capsule mould, being lubricated with oil, is merely dipped into the heated gelatin basis, and on being rotated carefully for a few moments in the air after its withdrawal from the liquid, the gelatin coating sets, forming, when the operation has been skilfully performed, an envelope of uniform thickness throughout. Owing to the elastic nature of the gelatin basis, it can be safely with care stripped from the metal beneath it without tearing. The open neck of the empty envelope is trimmed with scissors, after which the filling process may be commenced when a sufficient number of empty capsules have been

placed in the little depressions or apertures in the plate necessary to keep them in an upright position. The liquid is carefully injected into each by means of a graduated syringe, after which the open end of the filled capsule is closed by the application of a drop of the melted gelatin basis applied on the end of a heated metal rod, which assists the hermetical sealing by partially remelting the lips of the capsule. A large number of the metal moulds may be fastened to a plate or disc to which a handle is attached, and these can be dipped all at once into the melted basis, instead of immersing each separately, so that much time may be saved.

The temperature of the gelatin basis is of the greatest importance ; thus, if the liquefaction be too complete, only a thin film will adhere to the mould, and the resulting mask will be too attenuated, whilst if the solution be too viscid, the capsule after cooling will be unduly thick and clumsy.

If a powdered substance be intended for enclosure in the capsule, it can be introduced, after weighing, by means of a minute funnel.

Before dispensing, each filled capsule should be examined, and, if necessary, wiped carefully by a little cotton-wool moistened with oil, to remove any traces of the medicinal substance adhering to its outer surface. The finished capsules should be dispensed in a flat cardboard box, capable of accommodating them in a single layer.

For rectal and vaginal administration hollow suppositories or pessaries, consisting of oil of theobroma, may be made in the suppository mould, and filled with iodoform powder, mercurial ointment, or liquid medicines, and closed with a little plug or lid of the solid oil of theobroma.

CHAPTER X.

THE COMPOUNDING AND DISPENSING OF OINTMENTS.

THE making of an ointment is generally a very simple matter, only requiring perseverance and painstaking, which always repay the dispenser. It is often a matter of simple trituration ; and a pestle and mortar, with a spatula, are all the implements required. Rarely, if ever, will the extemporaneous ointments prescribed by the physician require any melting.

If two ointments, or an ointment and a liquid or oil, are ordered to be mixed, the simplest method of procedure is to weigh and measure the ingredients out on a porcelain slab, and thoroughly blend them with a long spatula. This will answer in many instances, but the dispenser is cautioned against making

extracts, powders, or gritty substances into an ointment in this way.

In such cases the substance to be incorporated with the fatty or oily basis is put into a mortar and ground with some minute quantity of excipient to the finest conceivable state of subdivision, and by far the best excipient ever devised is a little of the old-fashioned "elbow-grease." The pestle should be worked as shown in Fig. 5, and the mortar should be capable of holding very many times more of the ointment than is about to be made. When the powder, or extract, or crystal is put into it, it is subjected to firm powdering or rubbing. A very little of the fatty basis is added, and trituration continued till a smooth, impalpable paste is obtained; then the remainder of the basis is added gradually, sweeping the sides of the mortar and pestle from time to time with a spatula, so that all is thoroughly mixed. Often, however, it will be necessary to add something to facilitate the grinding before adding the ointment: thus, if camphor is ordered, it must be rubbed very fine by the aid of a little spirit which evaporates during the mixing. If an extract is to be added to an ointment it is first put into the mortar and rubbed to absolute smoothness with a little spirit, water, or glycerin, before adding the unctuous basis. If the extract is hard, or even of pilular consistence, the best plan is to previously warm the mortar by pouring hot water into it, or by lighting a small quantity of methylated spirit which has been placed in it and drying quickly with a cloth, when the extract can be rubbed to smoothness before a little of the basis is added. Soluble crystals, like iodide of potassium or carbonate of potassium or sodium, are triturated with a little water before adding the remaining ingredients. Iodine should be rubbed to powder, a few drops of spirit added, and the trituration continued. Iodide of sulphur should be most perseveringly rubbed down with a little olive oil, borax with a little glycerin, and red precipitate with distilled water.

Volatile liquids should be added after the other ingredients are well mixed, so that evaporation is reduced to a minimum, as in the case of prussic acid and chloroform.

Steel knives should not be used in the preparation of ointments with the alkaloids, or with acids, or especially with the acid nitrate of mercury, red precipitate, or yellow oxide of mercury ointments, which are ruined by the touch of iron. Many fine and pearly compounds made with cold cream are well prepared by mixing them up in a china cup with a silver or gilded spoon, and it is a safe rule for the young dispenser to use a bone or boxwood knife in making all ointments.

This is not intended as a complete list of the difficulties and their remedies in ointment making; but the writer has deemed it wise to enter more fully into the subject than its simplicity might apparently warrant, for just because the preparation of

this class of compounds appears to be very easy, so are they often carelessly compounded, to the vexation of the physician and the annoyance of the patient. It is not at all an uncommon thing to see sores irritated and eyes inflamed by the very remedies prescribed to soothe them, the coarse angular particles acting like so many little setons. It is hardly necessary to say that any ointment with the least trace of rancidity should not be compounded by the dispenser.

When the mixing has been finished the ointment is scraped out of the mortar with a bone or wooden spatula, or horn ointment scraper, and generally dispensed in covered or porcelain pots, and unless of very firm consistence, a piece of waxed paper should be inserted between the ointment and the lid, and pared neatly round. If it is at all approaching the fluid state a wide-mouthed bottle will be the best vessel. Occasionally, for the poor and in hospital, the common chip box is used.

CHAPTER XI.

COMPOUNDING OF SUPPOSITORIES, PESSARIES, AND BOUGIES.

SUPPOSITORIES are seldom prescribed except in the Pharmacopœial form ; but, as even these should be prepared by the dispenser himself, a passing notice may be made of their preparation. They are generally made in conical moulds, should weigh about 15 grains each, having cacao butter for their basis, and such other firmer substance, to enable them to solidify rapidly after being poured into the moulds ; this latter *desideratum* is assisted by having the moulds made of a massive block of gun-metal, which causes their rapid cooling (Fig. 16). The ingredients should be treated as if an ointment was to be made ; any powder or crystalline substance being rubbed to fineness with a little lard or a trace of the butter in a mortar or on a slab, whilst the remainder of it is being melted in a small cup on a water bath with the wax ; only enough heat must be used as will barely melt them, and when they begin to show signs of congealing the triturated ingredients may be added with a vulcanite or bone knife, and stirred constantly till a creamy mass is obtained, which is to be poured into the moulds. If the moulds are previously dipped in ice water, or in a little freezing mixture, made by dissolving sal ammoniac in water, the subsequent detachment of the congealed substance will be expedited. This latter part often gives trouble, the suppositories persistently adhering to the mould ; various plans are tried, and the simplest would be to wet the interior of the mould with water, but water will generally run off it in drops ; breathing into

it often answers, or dusting over the surface with lycopodium and blowing out the excess ; but by far the best method is to smear over the interior with soap liniment. Spermaceti will be found a more satisfactory addition to the cacao butter than wax, as, owing to the rapidity of its congealing, the mass is not so liable to adhere ; oil applied to the interior of the moulds is liable to cause the suppositories to stick fast in their conical depressions.

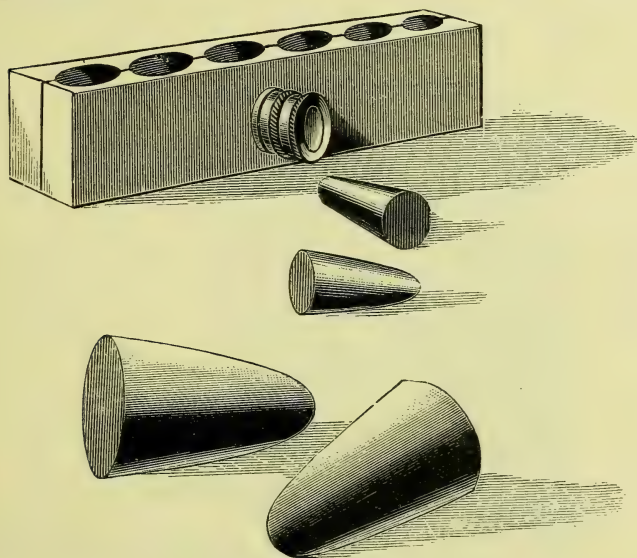


FIG. 16.

In the case of alkaloidal salts and watery extracts a more suitable basis than cacao butter will be found in the following gelatin basis :—1 ounce pure gelatin should be rapidly washed in a little cold water and left to soak for about one hour in 3 ounces water ; glycerin 3 ounces by weight is then added and the mixture thoroughly incorporated on a water bath till the weight is reduced to 5 ounces. The melted mass, after being skimmed, is then poured into a wide-mouthed stoppered bottle, and when cold covered with a layer of alcohol. The basis when required is melted with the alkaloid or extract in a small evaporating dish and poured into moulds previously greased with a little oil. The same plan may be employed in making the next class of preparation. Extract of ergot, cocaine, and hazeline make elegant masses with such a basis. The relative

proportions of glycerin, water, and gelatin may be varied to suit the amount of aqueous medicament. The official glycerin suppositories contain 70 per cent. glycerin.

Pessaries and suppositories, containing green extracts, may be readily made by first rubbing the extract with a few drops of warm water till of a creamy consistence, adding one-third part of the oil of theobroma, rubbing again till smooth, and adding the mixture to the remaining two-thirds of the oil heated ; after thorough incorporation, and further heating if necessary, the mass may be poured into moulds.

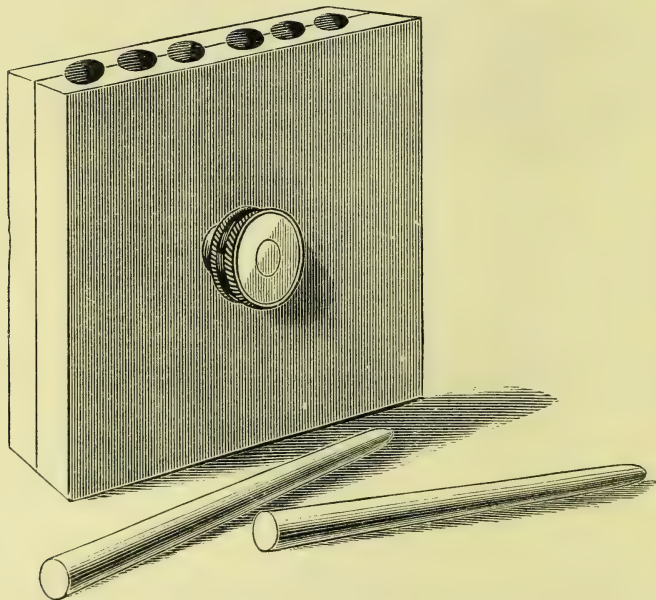


FIG. 17.

Pessaries are made in precisely the same way, only they are from three to eight times larger (Fig. 16), generally weighing about 1 drachm, and made in larger moulds of a similar shape. If a very small pessary is ordered, it may be made as two suppositories fused at their bases, forming a double cone, and this shape answers well when it has to be moulded by the fingers.

Bougies are also made like suppositories, but they differ in shape, being long and thin (not conical) as is shown in Fig. 17. They can be made in a mould, but great care has to be exercised, for, on account of the small bore of the mould, the

melted mixture may become plugged in its transit down the canal, and thereby be spoilt. The material must consequently be more thoroughly liquefied before pouring into the mould than in the case of suppositories and pessaries, or the metal may be slightly warmed by immersion in warm water to prevent rapid congealing of the mixture whilst being poured down the narrow canal.

The following mode of operation has been advocated as most successful in making bougies :—A long glass tube is obtained, having a bore the size of a bougie (about $\frac{3}{16}$ inch in diameter), and also a piece of glass rod of equal length which can just be passed through the tube. The tube is slightly warmed if necessary, and the melted mass is sucked up into it. When it has set completely it is carefully pushed out by means of the glass rod, and cut into the required number of bougies of equal lengths. One end can be moulded by the fingers to a blunt point.

Suppositories, pessaries, and bougies should be dispensed in cardboard boxes, with cotton-wool; and the directions for their use should be plainly given by the physician, or written on the box by the dispenser, as sometimes in ignorance they are swallowed.

Should they contain any volatile ingredient, each ought to be wrapped either in tinfoil or in waxed paper.

CHAPTER XII.

DISPENSING OF BLISTERS AND PLASTERS.

BLISTERS are generally spread upon adhesive plaster. In the case of public charitable institutions, they may be spread upon brown paper; but, unless directed otherwise, they should always be put upon the adhesive plaster, which is itself spread upon thin glazed calico, and sold in sheets of a yard each. The twilled calico, swansdown, and other fabrics, as a rule, are not so suitable. The dispenser takes the size of the required blister, which is commonly oval or square, and prepares a "shape" by folding a square piece of waste writing or wrapping paper twice upon itself, and with a pair of scissors he cuts the form and size of the blister out of the middle of this, rejecting the cut-out centre (Fig. 18).

He has now the exact shape (Fig. 19), the inner margin or edge of which is the same size and form as the circumference of the required blister. (This is precisely the same manner in which plaster shapes are made.) A piece of the thin sheet of adhesive plaster is cut about 1 inch larger than the blister, and may be gently warmed, only enough heat being used to make it *slightly*

sticky ; it is then quickly laid upon some firm smooth surface, and the shape pressed upon the adhesive side—where it should evenly adhere, but only to such a degree that it readily separates

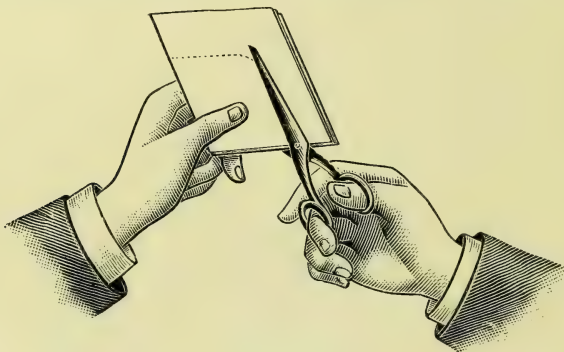


FIG. 18.

when pulled off. All is now ready for the spreading process, which should be accomplished by the thumb alone. The cantharides plaster of the Pharmacopœia is well adapted for this. A piece about the size required is kneaded between the

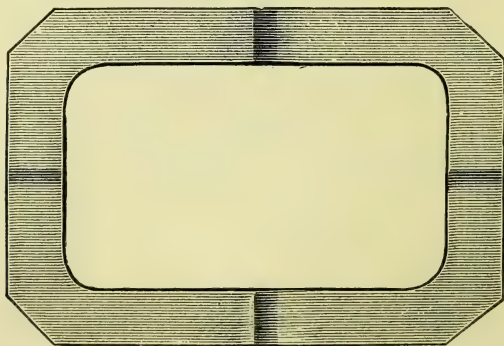


FIG. 19.

fingers until *uniformly* softened throughout, when the dispenser, steadying the shape and plaster with the fingers of the left hand, spreads a piece about the size of a bean with the side and front of the last joint of the right thumb, beginning at the corner next him, and continuing in a series of rainbow strokes till the plaster is covered (Fig. 20).

A long spatula, not unlike a dinner-knife, warmed so slightly that its temperature can be borne by the skin when pressed against the cheek, should now be firmly passed over the blister, removing superfluous plaster, and making its surface smooth and even. Some dispensers previously sprinkle a few drops of blistering liquid, or olive oil, over it to improve its appearance, but this is not necessary. The paper shape is now peeled off the plaster, and the edges trimmed neatly with a *large* pair of scissors, allowing a margin of plaster about $\frac{3}{8}$ inch wide to remain; a piece of waxed or oiled paper is laid on its surface, and the whole enclosed in a paper box or envelope. The dispenser or physician should be careful to direct that this paper be removed before application, as blisters and plasters have sometimes been rejected as useless, the paper never having

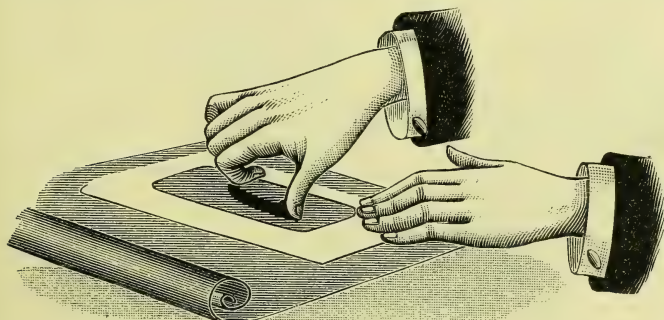


FIG. 20.

been removed. Instead of cutting the piece of plaster for the blister off the roll, the experienced spreader may lay the shape on the roll itself, thus saving the clippings, as shown in the figure.

Plasters are more difficult to spread, since they require heat, and they are often liable to be burned, creased, or uneven; and the dispenser who can spread a plaster properly will be always found to be one who can perform every other duty of the art of compounding satisfactorily; hence it may be looked upon as the test of pharmaceutical accomplishment to be able to perform this operation neatly and excellently. Plasters are generally spread upon sheepskin or stiff chamois leather, and sometimes over adhesive plaster which has been already spread upon linen, dimity, or moleskin; but when the physician orders a plaster without specifying the fabric upon which it is to be spread, he means it to be dispensed on the white sheep-skin which is kept by every dispenser. The same steps are gone

through exactly in cutting the shape as if for making a blister ; a piece of leather somewhat larger than the size of the intended plaster is cut off the skin, and pulled in different directions gently, to make sure that it will not yield too much when the weight of the iron goes on it. The leather is next placed on some soft, even surface ; a few quires of wrapping-paper laid on the dispensing counter answer very well. The plaster iron, which should not be too large, is now *slightly* warmed over a gas stove or in the fire, wiped clean, and passed over the surface of the leather, so as to remove every wrinkle and inequality ; the shape is laid on the counter and moistened on one surface with a little damp tow or sponge. The addition of some soap to the water in which the sponge or tow is wetted is a practical point worth remembering, or a little flour paste may be employed. (Excellent results are obtained by dipping the shape into water.) It is now placed upon the *rough* side of the leather, and pressed carefully and evenly with the palm of the hand near the wrist, until it adheres at every point to the leather, after which all will be found ready for the spreading process.

Some dispensers, especially those who have not much experience in plaster spreading, fasten the skin to a piece of board by means of a small tack at each corner so as to keep it thoroughly stretched, but yet capable of being moved about into any position during the spreading process.

The different plasters are kept in cylindrical rolls, and are melted as required, by means of the plaster iron, on the heating of which the success of the operation depends ; it should be warm enough to readily melt the plaster, without spoiling the leather ; its heat may be judged by pressing it against a clipping from the sheep-skin, which will become brown and curl up if the iron be too hot.

When the plaster iron is over-heated, a film forms on its surface, and often small particles of carbon adhere to it, which, coming off during the spreading, spoil the appearance of the plaster. To guard against this, the iron, after coming out of the fire, should be briskly rubbed against some soft solid substance, as a piece of wood or coarse cloth. Irons are now made which can be heated by allowing gas jets to burn in their interior, and thus there is no limit to the amount of work which one iron can accomplish without interrupting the operation.

The iron then being heated to the right degree, its flat face is pressed with a slight circular movement against the end of the roll of plaster, and the liquid plaster which drops down is caught upon a piece of strong, smooth brown paper, as shown in Fig. 21. If two or more varieties of plaster are ordered in combination, it is at this stage that they are melted together against the *face* of the iron, and mixed with its sharp *edge* on the paper ; and, when a thoroughly uniform creamy mass is ob-

tained, it is scraped along the surface of the paper to near its margin. The leather, with the shape attached, is now brought alongside, when a few strokes with the near edge and adjoining part of the face of the iron will spread the plaster over the surface of the leather, beginning at the edge next the operator, and sweeping round the far margins in a series of half ovals, watching the borders and corners, "for the centre will take care of itself" (Fig. 22). Towards the end of the process, when the leather is covered, the flat face of the iron may be used to smooth all irregularities, and, after a moment's delay, during which the plaster hardens, the shape may be pulled off, and the borders of the leather trimmed; in a medium-sized plaster at least $\frac{3}{4}$ inch

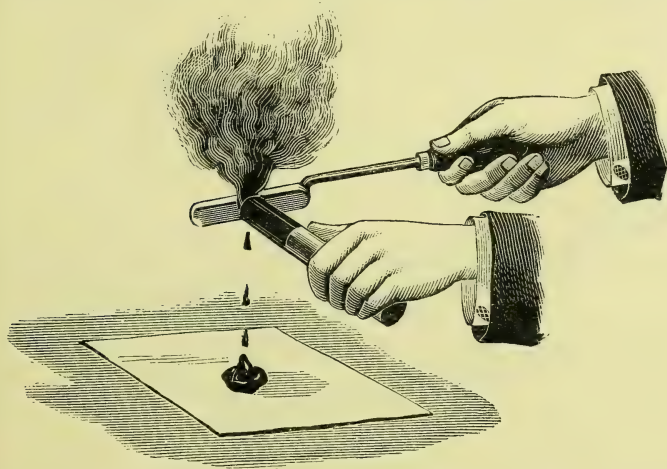


FIG. 21.

of border should be left. One iron will not do all this; and, before beginning, two should be selected; the second may come into use about the time the plaster is being transferred from the paper to the leather. If the plaster were melted directly on to the leather, as some advise, a mess would probably be the result.

When a combination or mixture of plasters is to be spread, one sometimes sees a ladle brought into requisition in which to melt and mix the ingredients, and from which it is poured on to the leather. The iron in such a case does not come into requisition until required for spreading.

Sometimes a plaster with an *adhesive* margin is ordered to be spread on leather, and it is a more troublesome process than the above. It may be done in this way:—The shape is cut as

described, and the centre piece, instead of being thrown aside, is damped, and pressed against the middle of the leather; the shape is taken, folded up again, and a piece cut out of it for the entire extent of its inner margin—thus enlarging it by the width of the intended adhesive margin; it is then stuck to the leather, leaving a space between the inner margin and the central piece of paper, which space is to be spread over with adhesive plaster, both papers pulled off, and the vacant central part covered over with the plaster as ordered, the edge trimmed, the surface loosely covered with a piece of waxed paper, and dispensed in a flat paper box. Until he has acquired great practice at spreading plasters, the dispenser will be unable to finish the inside space without a shape; and he may achieve all that is required in this way:—The leather to be covered with plaster is laid down flat

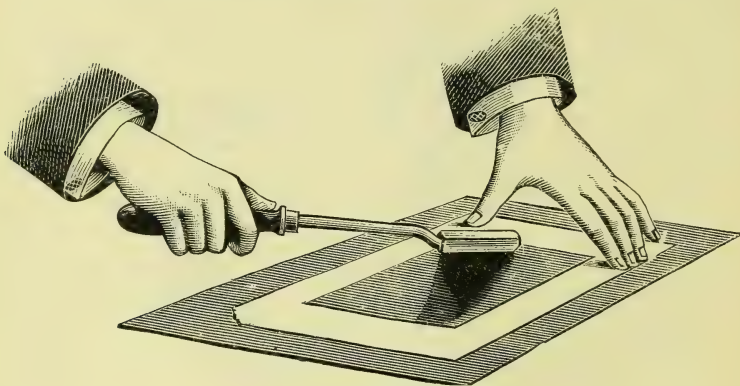


FIG. 22.

as before, and, with one good circular sweep of a large iron, its circumference is surrounded with a margin of adhesive or resin plaster; when this is cold, the shape, cut as before to the exact size of the plaster required, is laid down on the leather and attached, by means of a little soft soap, to the adhesive marginal surface. The plaster, having been melted as previously directed, on a separate bit of paper, is rapidly spread, as if there were no adhesive margin in the case, the shape is now torn off and the adhesive border trimmed. The student will observe that if these directions are followed he will have no plain margin outside the adhesive one, and seldom is such deemed necessary, so that this latter method is, on the whole, the better one for him to learn.

The great improvements made in plaster spreading by manufacturing chemists threaten to make this process a lost art in the hands of the ordinary dispenser.

CHAPTER XIII.

GENERAL HINTS TO THE DISPENSER.

IN our limited space we can only give a very few additional hints to the student of pharmacy upon such matters as do not naturally fall under the previous chapters. It is hardly necessary here to remind him that upon his simplest manipulations hangs the life of the patient, and though this solemn sense of his responsibility should be ever before his mind, it should not be allowed to paralyse his exertions, or tend to render him "unpractical." Over-confidence is a fruitful source of mistakes in pharmacy, as it is in other departments, and the pharmacist must be cautioned against falling into the habit of working mechanically or automatically, so common amongst the absent-minded. It is a frequent occurrence, for example, to see a dispenser walk in an automatic way up to a well remembered place where a bottle has always stood, lift it from its shelf, and pour out its contents without looking at the label. If the student should find himself falling into this habit, his remedy is to occasionally remove the bottles and occupy their places with others unmistakably different in shape and size.

Artificial Waters should not be employed, as they are wanting in the fragrance of the distilled preparations.

Solutions.—As quickness and despatch are generally considerations in pharmacy, it is advisable to keep some of the more frequently prescribed salts in solution ; and a few hints as to the most convenient strengths of these solutions may not be out of place here.

Alum, $2\frac{1}{2}$ ounces (troy) dissolve in 1 quart of distilled water, and each ounce of the solution represents $\frac{1}{2}$ drachm of the salt.

Potassium Bicarbonate, 1 ounce (troy), dissolved in enough distilled water to measure 4 ounces, makes a very suitable stock solution, as $\frac{1}{2}$ ounce of it contains 1 drachm, or 60 grains of the salt.

Potassium Chlorate, 1 in 24, made in the same way, is the best strength to suit all variations of temperature. The salt is soluble in a smaller quantity of water, but is apt to crystallise when the temperature of the atmosphere falls in the winter.

Epsom Salt, 1 in 2 ; **Potassium Bromide**, 1 in 3 ; and **Chloral Hydrate**, 1 in 1, make very convenient solutions, the latter particularly so ; each minim represents 1 grain of chloral, and it is easily calculated, but is liable to decomposition.

Official Pill Masses.—Some of the official pill masses become very hard on keeping, and get so brittle as to be unmanageable ; they may, with great advantage, be kept in the dry state, the powdered ingredients being mixed together, so that the men-

struum ordered in the Pharmacopœia to give consistence may be added at the time of dispensing. In this way Pil. Colocynth. Co., Pil. Aloes Barb., and Socot., Pil. Aloes et Ferri, and Pil. Hyd. Subchlor. Co. may be kept with the required proportions of the requisite menstruum marked on the bottles in which they are contained. This plan is often a great help if the physician happens to order too soft a mass.

Syrup. Ferri Iodidi for dispensing may be kept in the form of the liquor without decomposition or discoloration if a minute quantity of hypophosphorous acid be present to prevent oxidation. It can be made exactly to correspond with the official syrup by adding the requisite amount of sugar.

Mistura Ferri Co. can also be kept in a concentrated form, so that every drachm will contain the constituents of an ounce of the mixture, except the ferrous sulphate, which is to be weighed out and added with the remainder of the vehicle the last thing before dispensing.

Mistura Ammoniaci may be kept in concentrated form, so that 1 drachm of the liquid will represent 1 ounce of the official mixture.

Mist. Cretæ can be easily kept in powder, ready for the addition of cinnamon water.

Concentrated Infusions and Decoctions, so often employed by pharmacists for convenience, are to be condemned. *These preparations should always be made fresh as required.* The new departure of encumbering the B.P. with these costly preparations is to be deplored.

Substitution.—It cannot be too strongly impressed upon the student's mind that substitution should never be practised. By substitution is meant the using of an equivalent quantity of one preparation of a drug for that of another ; say, for instance, infusion of cinchona is required, it would be absolutely wrong to use an equivalent quantity of the liquid extract, as it is more than probable that this latter preparation does not contain the full quantity of total alkaloids and extractives that an equivalent quantity of bark in the infusion does. The student of pharmacy never should depart from the strict observance of the Pharmacopœia.

Unofficial Nomenclature.—Often the dispenser will be at a loss to understand the meaning of the prescriber, when he orders some preparations without using their correct official titles, and he then must have a consultation, or fall back upon the experience of himself or others. A few examples may be given :—When Magnes. Calc. is ordered, Magnesia Ponderosa B.P. should be used ; when Magnes. Carb., the *heavy* preparation is usually intended ; when Bismuth., or Bismuth. Alb., is prescribed, the subnitrate is the preparation generally in the mind of the

physician ; when Æther. Chlor. is ordered, it is best not to dispense "chloric ether," but Spirit of Chloroform B.P.

Liq. Morphiae is very often written in a prescription, and the dispenser will do well to employ Liq. Morph. Hydrochlor. When Extract Aloes is written, the rule was to use the Socotrine, but now that the Pharmacopœia recognises only Extract of Barbados Aloes, this latter preparation only should be dispensed.

Much confusion unfortunately exists in the memory of some prescribers about the mercurial chlorides, and fatal consequences have resulted. The Subchloride is often written Hyd. Chlor., Hyd. Mur., Hyd. Submur., and the Perchloride is occasionally prescribed as Hyd. Chlor., or Hyd. Bichlor.

If the dispenser find it impossible to consult the physician in such cases, he will not regret giving the Subchloride, if more than $\frac{1}{8}$ grain is ordered in each dose.

It will be well to remember that Hydrate of Chloral is sometimes carelessly written Hyd. Chlor.

Loose or Dry Ingredients.—Roots, barks, leaves or seeds, when prescribed in the crude state by the physician, should be cut, chopped, or bruised, so as to alter their physical characters and prevent their being easily recognised by the patient. For the same reason it will usually be advisable to reduce crystalline substances to moderately fine powder.

Incompatibility.—When the pharmacist gets a prescription where incompatible substances are ordered it is clearly his duty to compound it, unless *absolutely* incompatible, in which case the different ingredients will not mix, and, if possible, then he should consult the prescriber. Instances of such might be given to fill a large volume, and, unfortunately, no rule can be laid down for the guidance of the young dispenser, as it is still an open question with pharmaceutical authorities whether a compounder is justified in altering a prescription, suppose he find the emulsifier or pill excipient ordered by a medical man unsuitable. Much will depend upon his knowledge of the prescriber ; if he is satisfied that the incompatibility was known to him, it is clearly his best rule to follow the written law of the prescription, and carry out rigidly the intention of the prescriber. But if, upon the other hand, the chemical action (inevitable upon the mixing of the ingredients) was *evidently unintentional*, the dispenser will be justified in averting it by any means at his disposal. If the incompatibility produces such a change in the ingredients of the prescription as would probably risk the life of the patient, the dispenser must not compound it without a consultation. An example of such incompatibility may be instanced in the case of compounding chlorate of potassium with syrup of iodide of iron, the free iodine and chlorine liberated having proved fatal when the mixture was administered.

Iodide of potassium is easily decomposed by nitric and most other acids, which after a time liberate free iodine, which falling as a sediment, may be taken in such a dose as would prove fatal.

It is not an unusual mistake to order in tertiary syphilis large doses of iodide of potassium along with full doses of tincture of perchloride of iron; free iodine is precipitated, and in a concentrated mixture of this kind has caused death. A very dangerous combination has been occasionally prescribed when free iodine or a strong solution has been ordered with solution of ammonia or compound camphor liniment; the precipitated iodide of nitrogen is a most dangerous explosive. Reference has already been made to the explosive nature of pills containing oxide of silver and creosote; they have taken fire and caused serious injury to the patient. Fatal results have been reported in several instances where alkalies have been ordered in mixtures containing strychnine, as the alkaloid is precipitated by alkalies, and the last few doses containing the greater part of the insoluble strychnine have been swallowed, and have killed the patient. Strychnine is also thrown down by bromide and sometimes by iodide of potassium, and the insoluble bromide or iodide has in the same way caused death.

Looking at the question from the physician's point of view, the writer thoroughly endorses Mr. Ince's opinion:—"We have no right to expose a patient to the risk of imperfect combination, and here as a dispenser, I would act upon my own responsibility. The interest of the physician is best served by the dispenser who is a sentient being, and not an automaton."

Poisonous Doses, or doses which may strike the dispenser as decidedly risky to the patient's life, should not be dispensed unless the dispenser happens to have some evidence that such is within the prescriber's knowledge. If, for instance, the poisonous dose was *underlined*, *initialled*, etc., or as it is usual in Germany, followed by a note of exclamation, the dispenser can, without hesitation, send it to the patient.

We may conclude these necessarily brief suggestions on Extemporaneous Pharmacy by quoting the following guiding rules by Mr. Ince for the pharmaceutical student from the *Chemist and Druggist's Diary*, 1885. They epitomise the principles laid down in the foregoing chapters:—

"1. Read through a prescription rapidly, and in a manner suggesting no suspicion of doubt. 2. Write directions invariably before dispensing. 3. Avoid thus the use of blotting-paper. A good dispenser uses almost none. 4. If a mixture contains readily soluble ingredients, never use a mortar. Avoid effecting solution by heat, for fear of recrystallisation. 5. With syrups, and also ingredients not water, arrange in dispensing to rinse out the measure and leave it clean. A skilled dispenser shows very little traces of his work. 6. Carefully clean and put

away weights and scales after each operation. 7. Hold the scales firmly by the left hand, never lift them high above the counter, and judge of the weight as much by the indicator as by the position of the scale. 8. Select glass pans for scales, preferably of heavy make, and discard flimsy brass material, which corrodes speedily and becomes inaccurate. 9. Learn to judge of the quantity to be weighed with tolerable accuracy; train the eye as well as hand. 10. If in doubt, always begin with that in which you have no doubt. 11. Be rapid in manipulation. Finish wrapping, tying, or sealing quickly. Slow dispensing is bad dispensing, and arises either from deficient practice or want of knowledge. 12. Never, when in a shadow of a doubt, hesitate to ask advice from a fear of compromising your own dignity."

CHAPTER XIV.

OFFICIAL PHARMACY AND THE PHARMACOPŒIA.

THE British Pharmacopœia is published under the supervision of the Medical Council, and undergoes revision at irregular intervals. It must be regarded by the pharmacist and the physician as having all the authority of an Act of Parliament. The drugs, tests, and processes mentioned in it are said to be "Official" or "Officinal." The following pages will briefly describe the chief pharmaceutical processes referred to in it. The student will probably discover that many of these are but repetitions of processes already practised by him in the chemical laboratory—as precipitation, crystallisation, etc.; others, however, will be found to be peculiar to pharmacy—as percolation, infusion, etc.; and it will be advisable for him, before entering upon the study of the various preparations, to glance at a few of these more important processes—especially to those that are common to many groups of preparations, as—

Affusion or Ablution—by which is meant the pouring of water or other non-solvent liquid on any substance to cleanse it of its impurities. In the washing of a precipitate, for example, the student is directed to pour cold or hot water upon it, shake or stir briskly, allow the insoluble part to fall to the bottom by rest, and then to pour or draw off the supernatant liquid. In the British Pharmacopœia these simple operations are respectively dignified by the names of—

Affusion, Agitation, Subsidence or Deposition, and Decantation.

Analysis.—In the Pharmacopœia both the *qualitative* and *quantitative* methods are frequently directed to be employed; and of the latter sometimes the *volumetric* and sometimes the *gravimetric* process is made use of.—(See "Testing.")

Baths.—Sand, water, and steam are mentioned under “Fusion.”

Boiling or **Decoction** is largely employed in the manufacture of various decoctions, extracts, syrups, etc. Generally the directions are, that the article to be decocted is to be put into a covered vessel with cold water, and allowed to boil on the fire for a given time. If a larger quantity of water, with the substance in it, is to be boiled down to a smaller quantity, then the decoction is a mixed method of boiling and concentrating by evaporation, and an uncovered vessel is selected. The process of making extracts is quite different; here the evaporation or boiling is performed after the drug is separated from the original decoction, juice, or infusion. **Ebullition** is the ordinary chemical term for boiling, and is occasioned by the formation of bubbles of vapour within the liquid, which rise to the surface like gas bubbles. Decoction, strictly speaking, is the ebullition of a liquid, containing some vegetable substance whose virtues are to be extracted by the boiling liquid.

Bruising, Contusion, or Comminution is a process by which soft, elastic, or ligneous substances have their structure broken up before being subjected to the action of a solvent by infusion or maceration. It is employed to break down the cohesion of fibrous roots, and is applicable to all tough drugs, like ergot, cloves, asafetida, etc., and to fresh leaves and young juicy branches. The article to be bruised is put into an iron or strong stone mortar, and, with a straight up-and-down movement of the pestle, it is bruised, crushed, or pounded till the requisite degree of destruction of tissue is obtained, a little only being operated on at a time. The same object is often attained by cutting.

Calcination or **Incineration** is the process of exposing a substance to a high heat, so that water and volatile matters are driven off, or oxygen absorbed, and the residue left in a finely-divided powdery condition. The process is carried on by placing the substance to be calcined in a Cornish, Hessian, or other crucible, which is placed in a furnace. In this manner the Pharmacopœia directs magnesia and lime to be prepared from their carbonates.

Carbonisation is the process by which organic substances, like bones and wood, are heated without access of air, so that their chemical composition is altered or destroyed without oxidation, as in the manufacture of bone black and wood charcoal.

Clarification or **Depuration** is the purification of a substance, generally a liquid or semi-solid, by extracting its impurities, as in the case of honey, lard, suet, etc., by melting or heating, and, whilst fluid, straining through some texture like flannel. It is a modification of the process of filtration.

Crystallisation is the process which bodies undergo in passing from the liquid or gaseous state to assume definite and regular geometrical forms called crystals. This process is generally directed to be carried out by the cooling or evaporation of a solution containing the substance to be crystallised, or more rarely it is ordered to be effected by fusion, as in the case of some metals and sulphur ; by sublimation, as benzoic acid and corrosive sublimate ; or by precipitation, as in the instance of the red iodide of mercury. In obtaining crystals by evaporation the liquid is either boiled till its volume is reduced by the loss of vapour, or it may be kept at a lower temperature than the boiling point for a longer time till the same effect is produced, and when the concentration has proceeded so far that a scum or pellicle forms on its surface, the liquid is set aside to cool, and as the temperature falls crystals form. When they have ceased to grow or increase, the fluid part, which is now called the "mother liquor," is poured off, and the crystals drained and dried. A second or third crop may be obtained from the mother liquor by further evaporation and cooling, as in the first instance. The process is hastened by the presence of foreign bodies, as threads or sticks, round which the crystals quickly gather ; or by agitation, in which case the crystals will be found to be small. The slower the process the larger and more regular will be the crystals, and it is advisable not to evaporate just so far as the Pharmacopœia directs usually for most of its salts. The six systems of crystals are all well represented in the B.P.

In the case of some salts like alum, carbonate of sodium, and sulphate of iron, the water of crystallisation, which the salt carries down with it on assuming the solid form, is directed to be expelled by heat, thus increasing the strength of the substance by the weight of the water lost, which ranges generally from one-fourth to three-fourths of the weight of the original salt ; thus dried sulphate of iron is nearly twice the strength of the crystalline form of the drug.

Decoloration—a process by which substances like the alkaloïds Morphine, Atropine, etc., are deprived of colour—consists in treating a solution or mixture of the substance with powdered charcoal and filtering. Purified animal charcoal is directed to be used.

Despumation is the name given to the process by which many organic liquids are purified by the application of heat, when the impurity rises to the top as a scum, and is easily removed by skimming or by filtration. Though not directly mentioned under this name in the Pharmacopœia, this process is extensively employed, as in the making of the green extracts, and the practical pharmacist finds that the syrups made with organic liquids, like the majority of the official ones, keep much longer

by being despumated. This is the more necessary as it is difficult to find sugar absolutely pure and free from organic adulteration.

Desiccation is the name given to the process of drying drugs. (See under "Drying.")

Dialysis is the process by which crystalloids are separated from colloids by passing the liquid containing them through an animal membrane like parchment. The dialyser is floated upon the surface of water and the crystalloids pass through as in the preparation of solution of dialysed iron, which is now, however, non-official.

Digestion is one of several allied processes often confounded. It means the prolonged treatment, at a heat elevated, but below the boiling point, of a substance (such as a powdered root) in the liquid intended to dissolve out its soluble principles. It is the same as maceration at a higher temperature than that of the air.

Distillation is the process by which a liquid is converted into a vapour on the application of heat, and the vapour is condensed into a liquid again in a separate vessel. The variety of apparatus for the process is endless. The simplest would consist of a closed vessel called a retort, from the top of which a long tube leads to a receiver. On partially filling such a vessel with volatile liquid, and applying heat till boiling ensues, the vapour of the liquid would fill the upper part of the vessel and tube, during its passage through which it would be cooled or condensed, and drop into the cold receiver as a liquid. The object of distillation is to combine volatile substances which cannot otherwise be mixed, as in the preparation of the Waters, or to separate mixed volatile and fixed substances, as in making Spt. Ammon. Fetid., or to separate impurities from the liquid which could not be got rid of otherwise, or to regain the alcohol which has been used in the making of many of the extracts. Distillation is a mixed process, consisting of ebullition—by which, in the first instance, the volatile substance is converted into vapour—and of condensation, by which the vapour is again changed into a liquid.

Destructive or Dry Distillation is the process by which a body is decomposed by heat into volatile products which did not previously exist in it, the products being collected in a separate vessel, as in the production of acetic acid and tar from wood.

Fractional Distillation means the distilling of a mixture of substances volatile at different temperatures, whereby they may be separated and received into different vessels by regulating the temperature.

Drying is a process used in the preparation of a great many remedies. There are, however, no official directions given for

the drying of roots, leaves, seeds, etc.; these are generally submitted to a uniform temperature, after being spread out on shallow trays or drawers of network, in a room heated by steam or hot-water pipes. The best heat is one ranging between 100° and 130° F. Many plants which are used in pharmacy are dried simply by exposure to the sunshine of their native country, but this is not practicable in our latitude. Flowers should be allowed to dry spontaneously. Fleshy roots should be transversely sliced before being placed in the drying room. Crystals and precipitates, as a rule, stand higher temperatures and may be dried on a water bath. Others require still higher temperatures, especially when we aim at the expulsion of the water of crystallisation, as in drying alum and sulphate of iron—where a heat of nearly 400° is required. On the other hand, some salts, like the valerianate of zinc, must be dried at the ordinary heat of the surrounding atmosphere. Carbonate of potassium and slaked lime recently heated are used to absorb the water from alcohol, freshly burned lime from ether, whilst sulphuric acid is used in various drying processes.

Elutriation.—The process of powdering rough insoluble substances like chalk, ores, etc., and mixing them with water, so that the finer, light, powdery portion may be poured off after the coarser particles have quickly fallen to the bottom. It is done sometimes merely to wash away such impurities as sand, gravel, etc.; in its results it resembles sifting.

Expression is the process by which the juice or oil is squeezed out from vegetable substances, and the tincture or spirit from the marc after maceration or percolation. It is performed by putting the substance into a suitable press, and by mechanical pressure separating the solid from the liquid portions. Oils so obtained are called expressed or fixed oils, to distinguish them from volatile or distilled oils.

Evaporation is the process by which the volume of a liquid is reduced and its volatile constituents driven off by a heat ranging between that of the air and the boiling point of the liquid. It is employed in the making of extracts, in the crystallisation of salts, and many other operations in pharmacy. The vessels used should be very shallow, and present a large surface of the liquid exposed to the air. In evaporating vegetable juices and infusions, a moderate heat should be employed—say, about 140° F. The nearer the liquid is kept to the boiling point the quicker the evaporation; and small quantities only of vegetable infusions or juices should be subjected to the process, and in separate batches, which can be evaporated down still further if necessary, thus preventing deterioration by long heating. Stirring quickens the process, and the heat may be regulated by the use of a water, steam, or sand bath (for which see “Fusion”). Sometimes it is necessary that the evapora-

tion should be carried on over strong sulphuric acid, or in a vacuum, or by means of a current of dried air.

Filtration is a process by which we separate an insoluble matter or sediment from a liquid, by causing it to flow through the pores of blotting paper, flannel, felt, calico, or linen, the liquid after passing through being clear and bright. *Straining* or *colation* is a quicker, but rougher, process of the same nature, for the removal generally of *visible* foreign particles, by causing the liquid containing them to pass through the open meshes of muslin, tow, wool, asbestos, or wire netting. If a liquid is *perfectly* transparent, and offers no obstacle to the passage of light, it is said to be "bright," though it may be highly coloured. All tinctures should possess this quality; and if they do not, repeated filtration and rest will brighten them. In the case of very dark liquids, they should also be bright when examined in *minute* quantity by transmitted light. Opposed to this condition we have that of "muddiness," which is often an opprobrium to the pharmacist; it is caused by the presence of *invisible* particles in a state of suspension, producing translucency. A mixture or liquid is said to be "clear" when no *visible* particles of foreign matter are detected in it; hence a liquid may be bright, but not clear, if it contain a few coarse particles floating through it and is otherwise transparent. The treatment for muddiness or opalescence is Filtration; to produce clearness, *Straining* is the remedy. Filtration is hastened by the method of folding the filtering agent—generally unsized paper. When this is plaited or thrown into numerous folds or grooves the process is greatly expedited.

Fusion, Liquefaction or Melting, is the process by which solid bodies are rendered liquid by the application of heat; it is largely employed in making ointments, plasters, caustic sticks, and in purifying resins, and for the purpose of effecting decomposition—as in making Potassii Permang. The substances are put into a suitable vessel and heat applied, varying from a temperature of 90° , sufficient to melt lard in an open jar, to one of 800° for fusing zinc in an earthen crucible. Water, steam, and sand baths are frequently employed. The *water bath* consists of an apparatus by means of which water, or its vapour, at a temperature not exceeding 212° , is applied to the outer surface of a vessel containing the substance to be heated. In the *steam bath*, the vapour of water at a temperature above 212° , but not exceeding 230° , is similarly applied; and in the *sand bath*, a vessel partially filled with fine sand is placed upon the top of a stove or on the open fire, and the substance to be heated in a jar or crucible is thrust down into the sand; it differs from the steam or water bath in not limiting the degree of heat, and is no safeguard against any high temperature being reached; but it effectually prevents sudden changes in the degree of heat, keep-

ing the substance at a fairly uniform high temperature when care is exercised. Since alkalies and oxide of lead attack silicious substances, for them iron or silver crucibles must be used. Platinum also is attacked by alkalies, though very feebly.

Gathering of Plants, Roots, Leaves, etc., should be effected, when possible, in sunny weather, and at the time specified in any particular case in the Pharmacopœia. Generally, roots of annual plants should be dug up *before* flowering; and perennial roots should be gathered in autumn, and not till plants are two or three years old at least. Rhubarb should be six years of age. Leaves should be gathered before they begin to change colour, and those of biennial plants not till the second year—as hyoscyamus for example, collected in the first year of its life, is almost inert; some are directed to be gathered when the plant is beginning to flower, others when the fruit begins to form.

Barks should be collected when they come off most readily from the wood—*i.e.*, from trees in the spring and from shrubs in the autumn. Flowers should be gathered when about four-fifths expanded; the red rose, however, is collected in bud, otherwise it loses its astringency and colour; and the flower-buds of the clove become almost devoid of aroma if allowed to expand. Fruits and seeds, generally, are collected when ripe; but pimento, pepper, and others are exceptions.

Granulation is the process by which a coarsely crystalline salt is reduced to the condition of a granular powder by dissolving it in water and evaporating the solution—incessantly stirring till the product becomes dry. Carbonate and citrate of potassium are thus made, and sometimes substances which can scarcely be reduced to powder otherwise are treated in this way, such as sal ammoniac and nitre.

The process is now modified in the B.P. for the making of several effervescing salts. Thus Epsom salt is first dried till its weight is considerably lessened; it is then reduced to powder and mixed with the powdered sugar, acids, and alkaline salts, the dry mixture is heated between 200° and 220° F., and kept stirred till granulation occurs. The granules are separated into uniform and convenient sizes by means of sieves.

Infusion is the process of extracting from a body, commonly of vegetable origin, its virtues or soluble parts, by treating it for a short time with water in a covered vessel, the substance being first reduced to a state of moderate subdivision or coarse powder; generally water in the act of boiling is used. Cold water is used to extract the virtues of calumba, in order to avoid dissolving the starch contained in it; and quassia yields up its active principles more readily to cold than to hot water. As a rule, the preliminary subdivision of the substance need not be carried to the same extent as for tinctures.

Levigation is the name given to a process like "Elutriation," in which an insoluble substance is *ground* into powder in presence of water or some liquid in which it is insoluble, the finer parts washed away and collected, the coarser being returned for further grinding with water, and so on till a fine powder is obtained. Red precipitate may be thus reduced. Elutriation is applicable to cheap, coarse materials like chalk and ores, where the refuse is not ground, but rejected.

Lixiviation is the process of acting upon a compound or mixed solid with water, in order to dissolve out a soluble salt, the solution being poured off the insoluble residue and evaporated, as is done in the preparation of pearl-ash from wood-ashes.

Maceration is the process of steeping or soaking at the ordinary temperature of the atmosphere a substance in a liquid capable of dissolving some of its soluble constituents. The liquid is called the *menstruum*, and the rejected matter, which is insoluble, is spoken of as the *marc*. Several tinctures are directed to be prepared in this way. It differs from digestion in being carried on generally for a much longer time, and without heat, and spirit of various strengths is commonly the menstruum. The drug should be previously reduced to a proper state of comminution by bruising, cutting, or powdering.

The process is now described in the B.P. thus :—"Place the solid materials in the whole of the menstruum in a closed vessel for seven days, frequently agitating. Strain. Press the marc. Mix the expressed liquid with the strained liquid. Filter if necessary."

Percolation or **Displacement** is one of the most important processes in pharmacy, being extensively used in the preparation of tinctures. It consists in packing into a short, wide tube, closed at one end by tying a piece of calico over it, the substance, in a state of coarse powder, whose virtues are desired to be extracted, and pouring into the tube the menstruum—generally diluted alcohol. As the spirit filters its way through the column of powder it dissolves out the soluble principles, and drops finally into the receiver below as a bright tincture. The process may thus be defined to be the "filtration of a liquid through a porous column of a powdered material, so that it may extract its soluble matter." It is not adapted to gummy or adhesive substances, but possesses the great advantages over maceration in being quicker, and in the fact that after the fluid has ceased to drop, the tincture still left in the tube can be displaced by pouring in more spirit or water on the top of the marc. At the bottom of the tube, immediately over the calico, a layer of fine pebbles or coarse river sand prevents the powder closing its pores (Fig. 23).

If the powder be too fine, it gets into a cake, and prevents the passage of the spirit ; and, if too coarse, the spirit runs between

the particles without dissolving out their active properties, flowing into little channels through the tube into the receiver. The B.P. now states the degree of fineness requisite for several vegetable tinctures, by ordering the powder to be passed through sieves of definite make.

The following are the directions given in the B.P. for the process of percolation in the making of a tincture :—Moisten the solid materials with the prescribed quantity of menstruum, and set the mixture aside in a closed vessel for twenty-four hours. Pack the mixture in a percolator, lightly closed or otherwise, according to the nature of the materials. Pour over the contents, at intervals, further portions of the menstruum, always maintaining a layer of liquid above the materials, and allow percolation to proceed, slowly at first, and afterwards less slowly, until a sufficient quantity of the menstruum has been used to produce about three-fourths of the volume of the finished tincture, or until exhaustion of the solid materials has been effected. When liquid ceases to pass, remove the marc from the percolator, and submit it to pressure. Filter the expressed liquid, if necessary, either at once or after standing for twenty-four hours ; mix the filtrate with the percolate, and then add a sufficient quantity of menstruum to produce the prescribed volume of tincture.

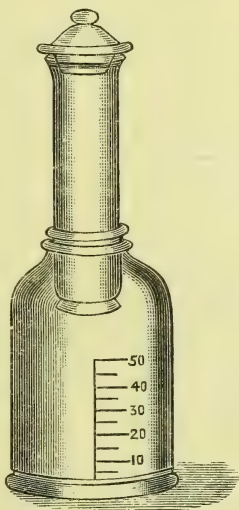


FIG. 23.

Pulverisation is the process of reducing solids to powder. The barks, roots, leaves, stems, and fruits of trees and plants are first thoroughly dried, and afterwards ground in a mill, of which there are many kinds. Leaves lose as much as 80 per cent. of their weight by drying and powdering, the powder thus gaining greatly in strength over the fresh leaves. Substances are reduced to the coarse powdered state necessary for infusion and percolation just as they are required, by bruising in an iron mortar, operating only on small quantities at a time, and then passing the particles through sieves whose meshes are formed of parallel wires arranged with varying degrees of closeness, the powder which passes through being designated according to the number of parallel wires within a linear inch of the sieve surface. Camphor can only be powdered by adding about the fourth of its weight of alcohol, and triturating it to dryness. Spermaceti, in like manner, by adding a little alcohol, may be easily reduced

to powder; squill and tragacanth are best powdered warm. Some substances must be powdered and rubbed with water—"Levigation"—others by granulation, as zinc and tin; and iron, by filing or reducing with hydrogen. The powder differs from the vegetable drug of the same name, by having less water, essential oil, or volatile constituents, less woody fibre, and in being generally more active—powdered opium being at least one-eighth part more active than the fresh drug.

Precipitation in pharmacy, as in the chemical laboratory, is the process by which we get a substance deposited from a solution, either by adding a second liquid in which it is insoluble, as in pouring water into spirit of camphor; or by mixing two solutions of different salts which combine and form an insoluble compound, as in mixing solutions of perchloride of mercury and iodide of potassium together, the iodide of mercury being thrown down as an insoluble crystalline powder, which is afterwards to be washed by the process of "Affusion."

Sifting is the process of separating the coarser from the finer particles of pulverised substances, and is generally performed by passing them through the meshes of fine wire, horse-hair, or muslin sieves (see also under Pulverisation). When fruits, like prunes, tamarinds, or figs, are ordered to be sifted, the operation is called "Pulping"; here considerable force must be employed to press the finer particles through, which, in the case of dried powders, are allowed to drop through by their own weight or by light pressure.

Solution.—The condition of a substance dissolved in a liquid is a state difficult to define. In the case of salts, acids, and bases the generally accepted view is that in dilute solutions of these electrolytes a greater part of their molecules are "dissociated"; these under the names of "ions" are supposed to be charged with opposite kinds of electricity, which cause them to move freely in different directions in the solution.

The theory that chemical change results when solution occurs goes under the name of the "hydrate theory." In some cases heat and in others cold is produced as a result of solution of a substance in water, the substance having united with xH_2O . That a chemical change occurs is exemplified in the behaviour of alcohol and chloroform as solvents of iodine. With alcohol, iodine forms a brown solution; with chloroform, it is violet.

Most of the instances of solution in pharmacy are *simple*, as the solution of sugar in syrup, in which case the sugar is found unaltered on evaporation; in others, as in the saccharated solution of lime, the substance is in a state of *chemical* solution, and cannot be recovered unaltered on evaporating. The process of solution, with very few exceptions, is quickened by heating the solvent, and having the substance to be dissolved in fine division. Both these advantages are gained by the ordinary method of

rubbing the substance in a mortar, with hot water. When the hot solvent ceases to dissolve any more of the substance, the solution is said to be saturated, and, on cooling, will always deposit some of the salt in crystals, the liquid, when cold, being called a cold saturated solution.

Standardisation is the name given to the process by which certain preparations, as those of opium, cinchona, belladonna, ipecacuanha, jalap, nux vomica, and cherry-laurel water, are made to contain a definite and uniform amount of the alkaloidal or active principle of the vegetable drug from which they are extracted, regardless of the amount or quantity of the crude drug employed in making the preparation.

Sublimation is the process by which a solid is reduced by heat to the state of a vapour, which is condensed and deposited on the surface of another vessel, either in masses, when it is called a *sublimate*, like arsenic; or in a feathery pulverulent state called *flowers*, as in the preparation of sulphur.

Testing.—The B.P., to ensure the purity and identity of its different preparations, directs in every convenient case, certain tests; thus the ordinary *Qualitative* analysis is employed frequently. Take, for example, "Acid. Aceticum," which should contain 33 per cent. of hydrogen acetate. The pharmacist is directed to show that it contains no lead, copper, sulphates, chlorides, etc., by employing the tests for these substances, but it is necessary to prove also that it contains the requisite percentage of acetic acid by *Quantitative* analysis, and the *Volumetric* method, which estimates the quantity by *measuring* the volume of the reagent necessary to produce the change, and afterwards calculating the weight used; and he is informed that "each gramme should require for neutralisation 5.5 cubic centimetres of the volumetric solution of sodium hydroxide." In testing the strength of diluted phosphoric acid, a different system—the *Gravimetric*—is directed. A given weight of this acid is poured upon a known weight of oxide of lead, and phosphate of lead is formed. This, after being dried, is weighed—the increase in weight giving the amount of phosphoric anhydride present. Complete volatilisation is the test used for several salts, as those of mercury.

Trituration is the process of reducing solid substances to the state of powder by continued rubbing. Generally, in pharmacy, the operation is conducted in a wedgwood mortar. (See under "Dispensing of Mixtures" and "Pills," pages 11 and 27.)

WEIGHTS AND MEASURES

OF THE

BRITISH PHARMACOPŒIA.

IMPERIAL SYSTEM.

MEASURES OF MASS.

1 Grain	gr.		
1 Ounce (Avoir.)	oz.	=	437·5 grains
1 Pound	lb.	= 16 ounces	= 7000 „

MEASURES OF CAPACITY.

1 Minim	min.		
1 Fluid Drachm	fl. dr.	=	60 minims
1 Fluid Ounce	fl. oz.	=	8 fluid drachms
1 Pint	O.	=	20 fluid ounces
1 Gallon	C.	=	8 pints

MEASURES OF LENGTH.

1 Inch	in.		
1 Foot	ft.	=	12 inches
1 Yard	yd.	=	36 inches

RELATION OF VOLUME TO MASS.

1 Minim is the volume at 62° F. of	0·9114583	grain of water	
1 Fluid Drachm „	54·6875	grains of water	
1 Fluid Ounce „ 1 ounce or	437·5	„	
1 Pint „ 1·25 pounds or	8750·0	„	
1 Gallon „ 10 pounds or	70000·0	„	
*109·7143 minims	=	the measure at 62° F. of 100	„

WEIGHTS AND MEASURES OF THE METRIC SYSTEM.

MEASURES OF MASS.

Milligramme	=	the thousandth part of 1 gramme or 0·001 gramme	
1 Centigramme	=	the hundredth „ „	0·01 „
1 Decigramme	=	the tenth „ „	0·1 „
1 Gramme	=	weight of a millilitre of distilled water at 4° C. (39·2° F.)	1·0 „
1 Dekagramme	=	ten grammes or	10·0 „
1 Hectogramme	=	one hundred grammes or	100·0 „
1 Kilogramme	=	one thousand grammes or	1000·0 „

MEASURES OF CAPACITY.

1 Millilitre	=	the volume at 4° C. of	1 gram. of water
1 Centilitre	=	„ „	10 „ „
1 Decilitre	=	„ „	100 „ „
1 Litre	=	„ „	1000 „ (1 kilog.)

* Taken as 110 mins. throughout the B.P.

MEASURES OF LENGTH.

1 Millimetre	=	one thousandth part of 1 metre, or 0'001 metre
1 Centimetre	=	one hundredth ,, ,, 0'01 ,,
1 Decimetre	=	one tenth ,, ,, 0'1 ,,
1 Metre	-	- - - - - - 1'0 ,,

RELATION OF CUBIC MEASURES TO MEASURES OF CAPACITY.

1 Cubic Centimetre	=	0'99984 millilitre
1 Cubic Decimetre	=	0'99984 litre, or 1,000 cub. centim.

1'00016 Cubic Centimetres	=	1 millilitre
1'00016 Cubic Decimetres	=	1 litre, or 1000 millilitres

RELATION OF THE IMPERIAL STANDARDS TO THE METRIC STANDARDS.

Standards of Mass.

1 Pound	=	453'59243 grammes
1 Ounce	=	28'34953 ,,
1 Grain	=	0'064798918 gramme, or 0'0648 grm. nearly

Standards of Capacity.

1 Gallon	=	4'5459631 litres
1 Pint	=	0'5682454 litre or 568'336 cub. cent. nearly
1 Fluid Ounce	=	0'0284123 ,, 28'417 ,, ,,
1 Fluid Drachm	=	0'003552 ,, 3'552 ,, ,,
1 Minim	=	0'000059 ,, 0'059 ,, ,,

Standards of Length.

1 Yard	=	0'914399 metre
1 Foot	=	0'30480 metre=30'48 centimetres
1 Inch	=	0'02540 metre=25'40 millimetres

RELATION OF THE METRIC STANDARDS TO THE IMPERIAL STANDARDS.

Standards of Mass.

1 Milligramme	=	0'015 grain nearly
1 Centigramme	=	0'154 ,, ,,
1 Decigramme	=	1'543 grains ,,
1 Gramme	=	15'4323564 grains
1 Kilogramme	=	2 lbs. 3 ozs. 119'8564 grs., or 15432'3564 grains

Standards of Capacity.

1 Cubic Centimetre	=	16'95 minims
1 Litre	=	1'75980 pints, or 1 pint 15 ozs. 1 dr. 34 mins. nearly

Standards of Length.

1 Millimetre	=	0'039370 inch
1 Centimetre	=	0'39370 ,,
1 Decimetre	=	3'9370 inches
1 Metre	=	39'370113 inches, or 1 yard 3'37 inches nearly

RELATION OF ENGLISH TO METRIC MEASURES.

1 Minim	=	·059 c.c., or 5·9192 centimils	
2 Minims	=	·118 c.c. „ 1·18384 decimils	
3 „	=	·178 c.c. „ 1·77576 „	
4 „	=	·237 c.c. „ 2·36768 „	
5 „	=	·296 c.c. „ 2·9596 „	
6 „	=	·355 c.c. „ 3·55152 „	
7 „	=	·414 c.c. „ 4·14344 „	
8 „	=	·473 c.c. „ 4·73536 „	
9 „	=	·533 c.c. „ 5·32728 „	
10 „	=	·592 c.c. „ 5·9192 „	
11 „	=	·651 c.c. „ 6·51112 „	
12 „	=	·710 c.c. „ 7·10304 „	
13 „	=	·769 c.c. „ 7·69496 „	
14 „	=	·828 c.c. „ 8·28688 „	
15 „	=	·888 c.c. „ 8·8788 „	
16 „	=	·947 c.c. „ 9·47072 „	
17 „	=	1·007 c.c., or mils	
18 „	=	1·066 c.c. „	
19 „	=	1·125 c.c. „	
20 „	=	1·184 c.c. „	
25 „	=	1·480 c.c. „	
30 „	=	1·776 c.c. „	
35 „	=	2·072 c.c. „	
40 „	=	2·368 c.c. „	
45 „	=	2·664 c.c. „	
50 „	=	2·960 c.c. „	
55 „	=	3·256 c.c. „	
1 Fluid Drachm	=	3·552 c.c. „	
2 Fluid Drachms	=	7·104 c.c. „	
3 „ „	=	10·656 c.c., or 1·0654 centilitres	
4 „ „	=	14·209 c.c. „ 1·4206 „	
5 „ „	=	17·761 c.c. „ 1·7757 „	
6 „ „	=	21·313 c.c. „ 2·1309 „	
7 „ „	=	24·865 c.c. „ 2·4860 „	
1 Fluid Ounce	=	28·417 c.c. „ 2·8412 „	
2 Fluid Ounces	=	56·834 c.c. „ 5·6824 „	
3 „ „	=	85·251 c.c. „ 8·5236 „	
4 „ „	=	113·667 c.c. „ 1·1364 decilitres	
5 „ „	=	142·084 c.c. „ 1·4206 „	
10 „ „	=	284·168 c.c. „ 2·8412 „	
15 „ „	=	426·252 c.c. „ 4·2618 „	
20 „ „ (1 pt.)	=	568·336 c.c. „ 0·56824 litre	
40 „ „ (1 qt.)	=	1136·672 c.c. „ 1·1364 litres	

RELATION OF ENGLISH TO METRIC WEIGHTS.

	(Gramme.)	(Centigrammes.)	(Milligrammes.)
1 Grain	= '0648 grm.	or 6'479 c.grm.	or 64'798 m.g.
2 Grains	= '1296 grm.	or 12'959 c.grm.	or 129'597 m.g.
3 „	= '1944 grm.	or 19'439 c.grm.	or 194'396 m.g.
4 „	= '2592 grm.	or 25'919 c.grm.	or 259'195 m.g.
5 „	= '3240 grm.	or 32'399 c.grm.	or 323'994 m.g.
6 „	= '3888 grm.	or 38'879 c.grm.	or 388'793 m.g.
7 „	= '4536 grm.	or 45'359 c.grm.	or 453'592 m.g.
8 „	= '5184 grm.	or 51'839 c.grm.	or 518'391 m.g.
9 „	= '5832 grm.	or 58'319 c.grm.	or 583'190 m.g.
10 „	= '6480 grm.	or 64'798 c.grm.	or 647'989 m.g.
11 „	= '7128 grm.	or 71'278 c.grm.	or 712'788 m.g.
12 „	= '7776 grm.	or 77'758 c.grm.	or 777'587 m.g.
13 „	= '8424 grm.	or 84'238 c.grm.	or 842'385 m.g.
14 „	= '9072 grm.	or 90'718 c.grm.	or 907'184 m.g.
15 „	= '9720 grm.	or 97'198 c.grm.	or 971'983 m.g.
15'432 „	= 1 Gramme	or 100'00 c.grm.	or 1000'0 m.g.

	(Grammes.)	(Centigrammes.)	(Milligrammes.)
1 Scruple (20 grains)	= 1'2959 g.	or 129'59 c.g.	or 1295'97 m.g.
2 Scruples (40 grains)	= 2'5919 g.	or 259'19 c.g.	or 2591'95 m.g.
3 „ or 1 Drachm	= 3'8879 g.	or 388'79 c.g.	or 3887'93 m.g.
1 Ounce (Troy)	= 31'1034 g.	or 3110'34 c.g.	

	(Grammes.)	(Centigrammes.)
$\frac{1}{4}$ oz. (Avoir.)	or 109'375 grs. = 7'087375 g.	or 708'7375 c.g.
$\frac{1}{2}$ „ „	or 218'75 „ = 14'17476 g.	or 1417'476 c.g.
1 „ „	or 437'5 „ = 28'34953 g.	or 2834'953 c.g.
2 „ „	or 875 „ = 56'699 g.	or 5669'9 c.g.
3 „ „	or 1312'5 „ = 85'0485 g.	or 8504'85 c.g.
4 „ „	or 1750 „ = 113'3981 g.	or 11339'81 c.g.
5 „ „	or 2187'5 „ = 141'7476 g.	or 14174'76 c.g.
6 „ „	or 2625 „ = 170'097 g.	or 17009'7 c.g.
7 „ „	or 3062'5 „ = 198'4465 g.	or 19844'65 c.g.
8 „ „	or 3500 „ = 226'7963 g.	or 22679'63 c.g.
9 „ „	or 3937'5 „ = 255'1458 g.	or 25514'58 c.g.
10 „ „	or 4375 „ = 283'495 g.	or 28349'5 c.g.
11 „ „	or 4812'5 „ = 311'8448 g.	or 31184'48 c.g.
12 „ „	or 5250 „ = 340'1945 g.	or 34019'45 c.g.
13 „ „	or 5687'5 „ = 368'5439 g.	or 36854'39 c.g.
14 „ „	or 6125 „ = 396'893 g.	or 39689'3 c.g.
15 „ „	or 6562'5 „ = 425'2494 g.	or 42524'94 c.g.
16 „ „ (1 lb.)	or 7000 „ = 453'59243 g.	or 45359'243 c.g.

RELATION OF METRIC TO ENGLISH WEIGHTS.

1	Milligramme, or '001 gramme	=	nearly	$\frac{1}{65}$	grain.
1	Centigramme, or '01	=	"	$\frac{2}{15}$	grain.
1	Decigramme, or '1	=	"	$1\frac{1}{2}$	grains.
1	Gramme (1 millilitre)	=	"	$15\frac{1}{2}$	"
5	Grammes	=	"	$77\frac{1}{6}$	"
10	"	=	"	$154\frac{1}{3}$	"
20	"	=	"	$308\frac{2}{3}$	"
30	"	=	" 1 ounce and	$25\frac{1}{2}$	"
40	"	=	" 1 " and	$179\frac{3}{4}$	"
50	"	=	" 1 " and	334	"
60	"	=	" 2 ounces and	51	"
70	"	=	" 2 " and	$205\frac{1}{4}$	"
80	"	=	" 2 " and	$359\frac{1}{2}$	"
90	"	=	" 3 " and	$76\frac{1}{3}$	"
100	"	=	" 3 " and	$230\frac{3}{4}$	"
200	"	=	" 7 " and	24	"
300	"	=	" 10 " and	$254\frac{3}{4}$	"
400	"	=	" 14 " and	48	"
500	"	=	" 17 " and	$278\frac{1}{2}$	"
600	"	=	" 21 " and	$71\frac{3}{4}$	"
700	"	=	" 24 " and	$302\frac{1}{2}$	"
800	"	=	" 28 " and	96	"
900	"	=	" 31 " and	$326\frac{1}{3}$	"
1000	" (1 kilogramme or 1 litre)	=	" 35 " and	120	"

RELATION OF METRIC TO ENGLISH MEASURES.

1	c.c. (cubic centimetre)	=	nearly	16'95	minims.
2	c.c. " "	=	"	33'9	"
3	c.c. " "	=	"	50'8	"
4	c.c. " "	=	"	1 dr. 7'61	"
5	c.c. " "	=	"	1 dr. 24'5	"
6	c.c. " "	=	"	1 dr. 41'41	"
7	c.c. " "	=	"	1 dr. 58'32	"
8	c.c. " "	=	"	2 drs. 15'22	"
9	c.c. " "	=	"	2 drs. 32'5	"
10	c.c. " "	=	"	2 drs. 48'9	"
15	c.c. " "	=	"	4 drs. 13'4	"
20	c.c. " "	=	"	5 drs. 37'8	"
25	c.c. " "	=	"	7 drs. 2'4	"
30	c.c. " "	=	"	1 oz. 0 drs. 26'8	"
40	c.c. " "	=	"	1 oz. 3 drs. 15'7	"
50	c.c. " "	=	"	1 oz. 6 drs. 4'7	"
75	c.c. " "	=	"	2 oz. 5 drs. 7'1	"
100	c.c. " "	=	"	3 oz. 4 drs. 9'4	"
500	c.c. " "	=	"	17 oz. 4 drs. 47	"
1000	c.c. " (1 litre)	=	"	35 oz. 1 dr. 34	"

The new designations *Mil*, *Decimil*, and *Centimil* have been referred to upon p. 4. These have been recognised by the Chairman of the B.P. Committee, the Board of Trade, and the *Comité International des poids et mesures*. The mil is equivalent to the older term—the millilitre or measure of the volume of 1 c.c., or the measure of 1 gramme of water at maximum density. The decimil and the centimil are equivalent to the one-tenth and the one-hundredth part of the mil respectively, the object of the innovation being to obviate the difficulty arising from the absence of any hitherto recognised subdivision of the litre smaller than its one-thousandth part.

The editor of the *Pharmaceutical Journal* gives the following table of the equivalents of the new measures :—

1 Centimil ($\frac{1}{100}$ millilitre)	= 0·1689 minim.
1 Decimil ($\frac{1}{10}$ millilitre)	= 1·6894 minims.
1 Mil or Millilitre ($\frac{1}{1000}$ litre)	= 16·8941 minims, or 0·2816 fl. dr.
1 Centilitre ($\frac{1}{100}$ litre)	= 2·8157 fl. drs., or ·3519 fl. oz.
1 Decilitre ($\frac{1}{10}$ litre)	= 3·5196 fl. ozs.
1 Litre	= 1·7598 pints.

The minim is equal to nearly 6 centimils, the fluid drachm to rather more than $3\frac{1}{2}$ mils, and the fluid ounce to nearly 3 centilitres, thus :—

IMPERIAL MEASURE.

1 Minim	= 5·9192 centimils.
1 Fluid Drachm (60 minims)	= 3·5515 mils.
1 Fluid Ounce (8 fl. drs.)	= 2·8412 centilitres.
1 Pint (20 fl. ozs.)	= 0·5682 litre.
1 Gallon (8 fl. pints, or 160 fl. ozs.)	= 4·5459 litres.

PART II.

THE ADMINISTRATION OF MEDICINES.

METHODS OF ADMINISTERING MEDICINES.

THE following are the various routes employed with the view of introducing drugs into the blood :

(1) By *swallowing*—the commonest and most convenient method—the medicines finding their way through the walls of the gastro-intestinal bloodvessels, or lacteals, into the current.

(2) By absorption from the *rectum* ; in this way the great majority of substances (in the form of enemata or suppositories) may find their way into the blood.

(3) By the *skin*. Through the cutaneous tissue medicines may be administered with the view of affecting the system, by five methods :—

1. *The Enepidermic.*
2. *Cataphoresis.*
3. *The Epidermic or Iatroleptic.*
4. *The Endermic.*
5. *By Inoculation.*

In the *Enepidermic* method friction is not employed ; the medicine to be so administered is simply placed in contact with the skin. Though this is, at the best, a slow and uncertain way to introduce a remedy into the circulation, the results of experiments show that the alkaloids dissolved in chloroform, when placed in contact with the unbroken skin, are readily absorbed, and soon find their way into the blood. Waller has shown that this endosmotic quality of chloroform enables it to penetrate the skin of the cadaver and to carry the alkaloids with it. Watery or alcoholic solutions either do not enter the blood at all when administered in this way, or are absorbed in such small quantities that they may be regarded as inert. Guaiacol painted over the skin and covered with oiled silk is rapidly absorbed, and reduces temperature with dangerous rapidity in this way, and so does sparteine, but to a much less degree.

The new method known as *Cataphoresis*, or *electric osmosis*, is a modification of the old *enepidermic* plan. The solution of the drug in contact with the unbroken skin or mucous membrane is acted upon by the platinum terminals of a galvanic battery, and it is found that most alkaloids, iodides, and perchloride of mercury find their way into the blood in this way. (Cataphoresis will probably only be employed where a *local* effect is desired, as in lupus erythematosus, etc.)

By the *Epidermic* method the medicine is also introduced into the system through the unbroken cuticle, but friction is employed. In this way we administer cod-liver oil in wasting diseases, and mercurial ointment in syphilis.

By the *Endermic* method the difficulty of absorption through the cuticle is obviated by its removal. This is accomplished by soaking a piece of porous fabric in strong solution of ammonia, applying it to the surface of the skin, and instantly covering it over with a piece of oiled silk, or a watch-glass, when speedy vesication ensues. The remedy, in the state of fine powder, should be dusted over the denuded spot, when its rapid absorption will occur. In this way morphine, strychnine, or atropine can be administered. The same result follows if the remedy be applied over a portion of skin whose cuticle has been removed by an ordinary blister.

By the operation of *Inoculation* (as for small-pox) remedies may be introduced into the system through the punctured cuticle.

(4) By the *hypodermic method*, a solution or mixture containing the substance being injected by a fine syringe into the *subcutaneous areolar tissue*, from which it is rapidly absorbed by the small bloodvessels and lymphatics. In this way morphine is best given to relieve severe pain, and ether to counteract the shock of formidable hæmorrhages. Normal saline solution may be administered to the amount of many pints by this route, in profound anæmia, or in puerperal convulsions, and it is the route always selected in serum therapy.

(5) By absorption from the *deep tissues*, as strychnine is often injected into the centre of a large muscle, by the method known as "*parenchymatous injection*," or as morphine or cocaine is injected into the sciatic nerve.

(6) By *inhalation*, the vapour of the substance finding its way rapidly into the circulation through the extensive sheet of pulmonary bloodvessels, as in the administration of anæsthetics and nitrite of amyl.

(7) By *injection into the veins* : as ammonia and saline solutions are injected in desperate emergencies, or as defibrinated blood may be transfused after excessive hæmorrhages, or as quinine solution is sometimes injected in very severe forms of malarial disease, and mercury compounds in rare forms of acutely malignant syphilis.

(8) Some authorities recommend the *injection* of the remedy *into an artery* ; and the writer once injected ammonia into the carotid in a desperate case of cerebral embolism with marked temporary benefit.

(9) By injection into the spinal canal through lumbar puncture, under the dura mater or deeply into the substance of the frontal lobes, or even into the basal ganglia.

(10) By absorption from the *vaginal* surface in the female, when given in the form of pessary.

(11) By absorption from the *bladder*. Some experimentalists have influenced the system by narcotic remedies injected into the vesical cavity. This route is certainly not to be recommended.

(12) By absorption from the *peritoneal* cavity, as in cases of severe hæmorrhages by injecting saline solutions, etc., into the sac of the peritoneum.

(13) By the *sublingual* method ; a hypodermic tablet placed under the tongue is rapidly absorbed.

These different methods or routes by which medicines find their way into the system should not be confounded by the student with the various *local* methods of applying remedies. Thus liniments, ointments, lotions, and antiseptics are applied to the skin with the view of causing local stimulation or sedative effects, and with the view of effecting its destruction caustics are sometimes employed. Sternutatories are applied to the nasal mucous membrane, and substances, by the method of insufflation, are brought in contact with the posterior nares and surrounding parts ; or the nasal douche may be employed with the same intention. Sialagogues are used to act on the salivary glands through stimulation of the nerves distributed to the mucous membrane of the mouth. The fauces and tonsils are reached by gargles, and the larynx by atomised spray ; while the bronchial mucous surface may be exposed to the local action of various inhalations, or to the fumes of volatile substances in a state of combustion.

In the same way, most of the cavities of the body, all tortuous wounds, and open sores, may be reached by injections, lotions, bougies, pessaries, suppositories, etc.

DOSAGE OR POSOLOGY.

The alphabetical arrangement of this work will enable the student to find at a glance the dose of every drug in the *Materia Medica*, and in a similar way the doses of all the various Galenical preparations are tabulated, it will thus be unnecessary here to have any repetition in the form of tables of doses.

Though the official doses may be regarded as safe guides, still the student must remember that there are many conditions which modify very considerably the effect of remedies, and should materially affect their dosage.

The most important of these modifying agents are :—

Age, Idiosyncrasy, Habit, Interval between the Doses, Disease, Climate, Race and Temperament, Sex, Body Weight, Method and Form in which the Medicine is Administered, Temperature, Hour of the Day, Mental Emotion, Fasting, Cumulative Action, etc.

Age.—This is the most important factor in determining the amount of the dose, and is the one which gives most trouble to the student. In the *Materia Medica* portion of this book, the dose for a child one year old is given under the heads of the most frequently employed infantile remedies. It should be remembered that children bear opiates very badly, and their use, consequently, is unsafe for children under one year old, even in most minute doses.

This intolerance of opium, it may be, has led to very erroneous ideas about the amount of the dose of other remedies for children.

Children will often bear nearly as full doses as adults, of various remedies, as may be seen in the case of arsenic, calomel, squill, belladonna, ipecacuanha, and many purgatives, like rhubarb, jalap, etc.

Gaubius took the average adult dose of a remedy, as 1, say 1 grain, and calculated the requisite amount for the different ages thus :—

Years	..	1	2	3	4	7	14	21
Grain	..	$\frac{1}{12}$	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{2}$	1

If the student wishes to find out the dose for a given age by Young's method, he has simply to add 12 to the age in years, and divide the age by the amount thus obtained, the answer giving a fraction, which is the required amount of the full adult dose. Thus, suppose the adult dose to be 1 grain, the dose will be :—

For a child 1 year old	..	$\frac{1}{1+12} = \frac{1}{13}$	grain.
For a child 2 years old	..	$\frac{2}{2+12} = \frac{1}{7}$	grain.
For a child 3 years old	..	$\frac{3}{3+12} = \frac{1}{5}$	grain.
For a child 8 years old	..	$\frac{8}{8+12} = \frac{2}{5}$	grain.
For a child 12 years old	..	$\frac{12}{12+12} = \frac{1}{2}$	grain.

Cowling's rule is to divide the number representing the age of the patient upon his next birthday by 24. Thus a child $5\frac{1}{2}$ years old would receive $\frac{6}{24}$ or $\frac{1}{4}$ of the full adult dose of ordinary remedies.

Brunton, in order to make Cowling's rule adapt itself to the metric system, proposes to use the number 25 instead of 24, and to multiply both the numerator and denominator of the fraction by 4. Thus, for a child 3 years, the dose would be ascertained in this way :—

$$\frac{4}{25} = \frac{16}{100} = \cdot 160.$$

Suppose the adult dose to be 1 gramme, the child of 3 years would receive $\cdot 160$ gramme, or 16 centigrammes.

Idiosyncrasy.—The physician meets with individuals in whom an ordinary dose of some well-known drug causes symptoms more intense, or entirely different from those usually observed to follow its administration, and when these cannot be accounted for by any known law, the case is generally regarded as one of idiosyncrasy.

It is said that patients are occasionally met with in whom the smallest dose of calomel will be followed by profuse salivation, whilst enormous doses of opium and chloroform are sometimes borne by those unaccustomed to their use. Iodide of potassium is the best example of a drug whose action is sometimes enormously increased by some idiosyncrasy in the patient, and antifebrin in some patients produces alarming dyspnoea and cyanosis.

Habit determines the dose of some medicines more than any other influence ; this is particularly true of narcotics. Many instances are recorded of opium eaters who took a pint of laudanum daily without experiencing the soporific effects of the drug, and the arsenic eaters of Styria are examples of the same.

The *Interval between the Doses* should determine to a large extent the amount of the dose ; this is too frequently overlooked in tables. No rule can, however, be laid down on the subject, but the student should be guided by the nature of the action of the medicine, the effects required to be produced by it, and the rate of its absorption, etc. The B.P. gives for certain remedies two series of doses—the larger as a single dose, and the smaller for repeated administration.

Disease modifies considerably the dose of a medicine ; instances of this may be seen in the large quantities of opium needed in desperate inflammations and intensely painful conditions of various nerves. Mercury and opium are badly borne in albuminuria, whilst in syphilis large quantities of mercury can be freely given.

Climate and *Temperament* possess varying influence upon the

amount of medicine required to produce its results in a healthy individual.

The *Temperature* of the patient and of the surrounding atmosphere has a very decided effect upon the dose of many medicines. Brunton has found that substances like veratrine, strychnine, etc., act in entirely different ways according as the temperature is high or low, this possibly being to some extent the explanation of the indication for the administration of stimulants in the *early morning* in severe fevers.

Fasting.—The rapidity with which medicines are absorbed and affect the system in this condition is well recognised.

The *Method by which the Medicine is Administered* affects the dose : thus, as a rule, the dose of remedies given by the rectum requires to be twice as great as if given by the mouth. Strychnine is an exception, being more active when given by the bowel than if swallowed. The dose may be said to be about a half, or two-thirds of the ordinary quantity when administered by the hypodermic method.

The *Form in which the Medicine is Administered* may affect its action, thus the active principles of drugs when isolated and given in a soluble form will act with greater rapidity and intensity than the corresponding amount of the crude drug, and some *conditions of the medicine* itself (chiefly those which relate to its rate of absorption or elimination) materially influence the amount of the dose.

Sex and Body Weight materially affect the action and dose of some drugs ; as a rule, women require smaller doses, and the dose should be less for a man weighing 100 pounds than for one double this weight.

The *Presence of other Drugs* in the patient's blood—the presence in the body of any other drug which has a similar or an antagonistic action, will obviously affect dosage very considerably.

Accumulation or Cumulative Action modifies to some extent the dose of a medicine. After digitalis, strychnine, or bromide of potassium has been administered for a time some observers have noticed the sudden onset of the marked physiological symptoms produced by these remedies. In such a case the dose must be diminished or suspended ; and after its renewal the interval between the doses should be lengthened. The explanation in these cases is clearly that the elimination of the drug has been interfered with ; the active principle of digitalis so contracts the renal vessels that its exit from the system is delayed ; the same is true of strychnine as pointed out by Gärtner.

INCOMPATIBILITY.

It is of the utmost importance that the physician should avoid ordering remedies which, when mixed, destroy each other's virtues. Incompatibility is generally said to be three-fold :—

1. *Chemical*. 2. *Therapeutical*. 3. *Pharmaceutical or Absolute*.

Of the first may be instanced syrup of squill and sal volatile ; acetate of lead and sulphuric acid or sulphate of zinc ; iron and the numerous substances containing tannic acid.

As an example of the second form of incompatibility may be mentioned a mixture, or pill, containing strychnine and Calabar bean.

Substances are said to be *absolutely* incompatible when they cannot be mixed together by the pharmacist, as borax and mucilage, or tincture of tolu, or benzoin, when ordered with water. (See page 17.)

Experience proves that many compounds, regarded formerly as incompatible, are valuable combinations. It does not follow if a mixture be *inelegant* that it is worthless, though some consider such should be regarded as incompatible and never employed. The official Mist. Ferri Co. and the formerly official Mist. Ferri Aromat. may be cited as popular preparations, though instances of incompatibles. Antipyrine should not be prescribed with spirit of nitre, iodine, prussic acid, and ferric salts.

Unfortunately no rule can be laid down to prevent the student ordering substances which oppose each other in their action in the system, or which chemically decompose each other, or which will refuse to take the intended shape from the hand of the dispenser. Nevertheless, a fair preliminary knowledge of chemistry and pharmacology will generally prevent such a mistake.

Amongst the various general rules of incompatibility there is one which the student should remember—that a drug should very rarely be ordered in combination with any of its tests or antidotes.

The substances in the following short list can be combined with so few preparations that the student will be wise to order them alone in simple solution.

Permanganate of Potassium, Tannic and Gallic Acids, Corrosive Sublimate, Iodide of Potassium, Salts of Lead, Salts of Zinc, Iodine and its liquid preparations, Nitrate of Silver, Tincture of Guaiacum, Citrate of Iron and Quinine, Free Chlorine in solution.

The student should turn to the short article on page 55 dealing with " Incompatibility " in dispensing.

The following excellent summary of incompatibilities is from " The Art of Dispensing " :—

LIST OF INCOMPATIBILITIES.

Acid arsenious, with lime-water, oxide of iron, magnesia.

Acids generally, with alkalies, acetates, metallic oxides.

Albumin, with acids, spirit, tannin, corrosive sublimate.

Alkaloidal salts generally, with tannin, alkaline and earthy carbonates, iodine and its compounds, liquorice, strong mucilages, alkaline and ammoniated tinctures.

Alum sulphate, with alkalies and alkaline carbonates.

Ammonium bromide, with mineral acids, alkaline carbonates, chlorine, chlorate and bichromate of potash, nitrate of silver, calomel.

Apomorphine (hydrochloride), with carbonate and bicarbonate of soda, salts of iron, iodine, and tannin.

Barium chloride, with sulphuric and phosphoric acids and their salts, tartrates and carbonates, medicinal wines, and vegetable infusions.

Bicarbonate of soda, with acids, tannin, salts of the metals and of the alkaloids.

Bismuth subnitrate, with tannin, sulphur, sulphide of antimony, calomel.

Chloral hydrate, with water (slow decomposition), warm water, alkaline carbonates, vegetable alkalies, ammonia salts, nitrate of mercury, calomel.

Chlorate of potash, with mineral acids, organic substances, sulphur, carbon, calomel, iodide of iron, etc.

Chlorine (chlorine water), with alkalies, alkaline carbonates, salts of ammonia, vegetable salts, nitrate of silver, lead salts, tannin, vegetable mucilages, extracts, waters, infusions, tinctures and syrups, milk, and emulsions.

Corrosive sublimate, with carbonates, lime-water, iodide of potassium, opium, vegetable infusions, tannin, but compatible with the carbonates of lime, baryta, and strontia, either in powder or super-carbonated solution.

Digitalis, with tannin, sugar of lead, iodine, iodide of potassium, alkaline carbonates.

Golden sulphuret of antimony, with bicarbonate of soda, cream of tartar, calomel, subnitrate of bismuth.

Gum arabic, with perchloride of iron, lead salts, spirit, ethereal tinctures, borax.

Iodine, with ammonia, starch, metallic salts, fatty or essential oils, emulsions, chloral, earthy carbonates, gum arabic, tragacanth, salep.

Iron powdered (iron reduced by hydrogen), with aloes, vegetable infusions and extracts, tannin, metallic and alkaloidal salts.

Iron salts, with alkaline carbonates, vegetable infusions and extracts, tannin, mucilage.

Lime-water, with acids, carbonates, ammonia salts, metallic salts, tartrates, infusions, tinctures, tannin.

Morphine and its salts, with oxide of iron, salts of iron, manganese, and silver.

Musk, with acids, acetates, tannin, ergot of rye, metallic salts.

Nitrate of silver, with hydrochloric, sulphuric, acetic, and tartaric acids and their salts, hydrocyanic acid and its compounds, iodine, iodide and bromide of potassium, alkaline and earthy carbonates, sulphur, and sulphide of antimony.

Nitrite of amyl, with tinctures, alkaline carbonates, calomel, lead salts, proto-salts of iron, iodide of potassium.

Opium, with alkaline carbonates, salts of the metals, tannin, iodine, chlorine water, and nux vomica. Although opium and belladonna are supposed to be physiologically incompatible, they are often administered together with good results.

Pepsin, with alcohol, tinctures.

Permanganate of potash, with organic substances.

Salicylic acid and salicylate of soda, with iron salts, iodide of potassium, lime-water.

Strophanthus (tincture) in water undergoes hydrolysis, with formation of a toxic substance.

Tannin, with mucilage, all metallic salts, lime-water, alkaline carbonates and bicarbonates, egg albumin, gelatin.

Tartar emetic, with acids, alkalies, soap, calomel, tannin, rhubarb, cinchona, gum arabic, opium.

The various prescriptions scattered throughout the portion of this work devoted to Therapeutics will materially assist the student in selecting elegant and useful forms in which to administer the most important remedies. Some, indeed, of these may be open to the objection of containing incompatible substances, as iodide of potassium and corrosive sublimate; but where a combination has been proved by experience to be valuable, its inelegance or supposed incompatibility has been occasionally overlooked.

THE COMBINATION OF MEDICINES.

The compounds of the last century, containing numerous absurd and incompatible ingredients, have forced most physicians into the opposite extreme of simplicity. In this way combinations of remedies of the utmost value are gradually falling into disuse.

Paris pointed out the great advantages to be derived from a judicious combination of medicines : thus he found that the action of a medicine may be increased by combining several different preparations of it. Suppose, for example, we wish to get *all* the virtues of cinchona, we obtain them best from a mixture like the following :—

Rx. *Ext. Cinchonæ Liq.* ʒij.
Tinct. Cinchonæ ʒj.
Decoct. Cinchonæ (B.P. 85) ʒiv.
Infus. Cinchonæ ʒx. *misce.*

Fordyce showed that a much more valuable and reliable remedy may be obtained by combining various substances whose actions resemble, or are identical with, each other. Thus the best diuretic would be a mixture of digitalis, squill, broom, and bicarbonate of potassium, infinitely superior to a proportionate dose of any one of them when administered singly.

The action of some medicines is increased by combining with them substances, the previously known qualities of which would have given no clue to their usefulness in this respect ; thus the diuretic power of digitalis and squill is intensified greatly by mercury.

By the judicious combination of two or more remedies we are often enabled to correct undesirable qualities possessed by one of them ; thus alkalies correct the griping of aloes, and hyoscyamus that of colocynth ; arsenic prevents the acne which follows the administration of bromide of potassium ; and atropine corrects the unpleasant symptoms caused by a hypodermic dose of morphine.

By a regulation of the dose of various remedies of the same class, though differing in their methods of action, occasionally a better compound may be obtained, as pointed out by Paris ; thus by giving a cholagogue with a saline, more effectual purgation is obtained ; or by combining bromide of potassium with a narcotic, a more prolonged hypnotic action may be produced.

WEIGHTS, MEASURES, AND SYMBOLS USED IN PRESCRIBING.*

The weights used in prescribing and dispensing are of the Imperial or Official system, which starts with the Troy grain and ends with the Avoirdupois pound.

1 Grain, <i>gr.</i>	
1 Ounce, <i>oz.</i>	= 437·5 grs.
1 Pound, <i>lb.</i>	= 7,000 grs.

* Upon pages 68 and 69 will be found a full table of the Weights and Measures of the British Pharmacopœia.

The official Measures of Capacity which are generally met with in prescriptions are :—

1 Minim	<i>min.</i>	=	·91 gr. of water.
1 Fluid Drachm,	<i>fl. dr.</i>	= 60 minims	= 54·68 grs. of water.
1 Fluid Ounce,	<i>fl. oz.</i>	= 8 fluid drs.	= 437·5 " "

It will thus be noticed that there is no *official* weight between 1 grain and 1 ounce; but the $\mathfrak{z}$ i. and $\mathfrak{z}$ ii., which represented the $\frac{1}{8}$ and $\frac{1}{4}$ part of the old Troy ounce, are still permitted to exist under protest. They are, when used in a prescription, to be taken as meaning 60 grs. and 20 grs. respectively, and not the $\frac{1}{8}$ and $\frac{1}{4}$ of the Avoirdupois ounce, which would be 54·68 and 18·22 grains respectively.

The French Gramme = 15·432 grs.

The following are the symbols and signs met with in prescription writing; they must not be confounded with the *official* symbols, which are simply the first two letters of the English words, as *fl. oz.*, *fl. dr.*, etc.

Gr.	=	Granum, 1 grain = $\frac{1}{480}$ of a Troy ounce, or $\frac{1}{437}$ of an Avoirdupois ounce.
$\mathfrak{z}$	=	Scrupulum, 1 scruple = 20 grains.
$\mathfrak{z}$	=	Drachma, 1 drachm = 60 grs. or 3 scruples; or $\frac{1}{8}$ of a <i>fluid</i> ounce, or 60 minims.
$\mathfrak{z}$	=	Uncia, 1 ounce = 1 Troy oz. (480 grs.) or 1 fluid oz. (480 minims), or 437·5 grains of water.
M.	=	Minimum, 1 minim = $\frac{1}{60}$ part of a fluid drachm or the volume of ·91145 grain of water.
Gtt.	=	Gutta, 1 drop, erroneously supposed to represent 1 minim.
O.	=	Octarius, 1 pint = 20 fluid ounces, or 1 $\frac{1}{4}$ lbs. of water.
C.	=	Congius, 1 gallon = 8 pints, or 10 lbs. of water.

DOMESTIC MEASURES.

The following should be regarded as the official equivalents of the domestic measures, and, when possible, all mixtures prescribed by the physician should be measured in properly graduated glass vessels.

A tea-spoonful	{ Cochleare minimum or } = 1 fluid drachm (3j.)
	{ Cochleare parvum }
A dessert-spoonful—	Cochleare medium = 2 fluid drs. (3ij.)
A table-spoonful	{ Cochleare amplum or } = 4 fluid drs. or $\frac{1}{2}$ oz.
	{ Cochleare magnum } (3iv. or 3ss.)
A wine-glassful	Cyathus vinarius = 2 $\frac{1}{2}$ fluid oz. (3iiss.)

The practice of measuring medicine in spoons is open to very serious objections, since seldom will two be found just alike in capacity, and the physician should make a rule of examining the spoon and ascertaining its dimensions before the patient uses it as a measure, in case no proper medicine-glass is at the moment available. The common "kitchen" spoon, which is generally made of iron and coated over with tin, fluctuates less in size than the other domestic measures; it can be relied upon as holding two fluid drachms. The wine-glass (*i.e.*, the sherry-glass) is generally stated to contain $1\frac{1}{2}$ to 2 ounces. It will, however, be nearly always found to contain at least $2\frac{1}{2}$ ounces, or the eighth part of an imperial pint. The writer believes that most physicians, when ordering medicine to be taken in doses of a wine-glassful, calculate upon the wine-glass containing at most 2 ounces. This idea arises from the old wine-glassful being equal to the $\frac{1}{8}$ part of the old wine pint of 16 ounces.

A small teacup contains on an average about 7 fluid ounces, and a breakfast-cup about 12 fluid ounces. These figures are much above those mentioned in most books.

The common glass tumbler holds $\frac{1}{2}$ pint, and is a fairly accurate measure.

In all cases where the physician prescribes an *active* medicine he should *insist* upon the dose being measured in a graduated glass.

The mistake of counting drops as minims has been already referred to in the Pharmacy section (p. 8).

PRESCRIPTION WRITING.

In one sense, this may be said to be the highest accomplishment of the educated physician, since it requires for its correct performance an intimate knowledge of all the medical sciences, and a practical acquaintance with the art of pharmacy. It is to be regretted that a more intimate knowledge of this latter art is not cultivated by the student of medicine. There could scarcely be a more erroneous idea than that which one occasionally meets with—*i.e.*, that pharmacy is beneath the notice of the physician. The writer believes there are very few things which give so great advantages in after-life to the prescribing physician as an intimate acquaintance with this art, as it is impossible to write correctly and elegantly many prescriptions without a practical acquaintance with many of the ordinary processes constantly employed in dispensing.

The Model Prescription should consist of the following parts :—

1. THE SUPERScription.
2. THE INSCRIPTION.
3. THE SUBSCRIPTION.
4. THE SIGNATURE.

1. The *Superscription*, which consists of the letter R., originally was used, it is supposed, to represent the symbol of the planet Jupiter, at a time when much of the virtue of a combination appeared to rest upon the deity or presiding star. By common consent, it is now regarded as representing the imperative mood of the Latin verb *Recipio*, to take ; hence the origin of the ordinary term “*recipe*.” The French physicians commence their prescriptions with P., or *Prenez*.

2. The *Inscription* may be called the *body* of the prescription ; it includes the names of the substances to be administered with their quantities, written in Latin, and as it is the most important part of the prescription, it will be referred to presently at more length.

3. The *Subscription* is made up of the directions (in Latin) for the guidance of the dispenser ; thus *misce*, often written *m.*, is frequently the only part in a prescription which belongs to the subscription.

4. The *Signature* includes the directions or instructions intended for the benefit of the patient. It is frequently written by the prescriber in English, and many recommend that Latin should never be used for this part of the prescription.

Mistakes are certainly liable to occur if the signature be

written carelessly, or if incorrect Latin be employed, but the same reasons which have determined the use of this language for prescriptions from an early time, apply equally well to the signature. Thus a prescription written in Latin can be read and understood by a pharmaceutical chemist or physician in every civilised country. Abbreviations and contractions can be employed without fear of being misunderstood, which could not be the case if any other language were substituted ; we are thus often able, by a single letter, to express the meaning of several English words.

It is often absolutely *necessary* to write the prescription in such a way that the patient may remain ignorant of the nature of its contents.

The use of long and elaborate Latin phraseology is to be condemned in prescribing, and the student, when he feels any difficulty in expressing himself in this tongue, had certainly better fall back upon his English when writing the signature. This he can do by using the Latin word *Signa*, after which the signature may be written in *unabbreviated* English.

The patient's name is written at the top or bottom of the recipe, preferably the top, as it is thus less liable to be overlooked or mistaken than if written where space is often limited. The prescriber's initials generally follow at the corner of the document opposite to the physician's right hand, and the date is written on the other side.

It is hardly necessary to remind the student of the necessity of writing clearly and legibly, and of avoiding the use of such contractions as might lead to mistakes.

The *body* or inscription of a model prescription should contain the following :—

The *Basis*, or principal active ingredient (*basis*).

The *Adjuvant*, or *Auxiliary*, to assist its action (*adjuvans*).

The *Corrective*, to correct or diminish some undesirable quality (*corrigens*).

The *Vehicle*, or *Excipient*, to give a suitable form for administration (*vehiculum*).

The following prescription may be regarded as a type of a very commonly ordered combination of remedies :—

R.	-	-	-	-	-	-	-	SUPERSSCRIPTION.
(Basis.)	Pot.	Acet.	3v.					} INSCRIPTION.
(Adjuvant.)	Tinct.	Digitalis	3j.					
(Corrective.)	Syr.	Aurantii	3j.					
(Vehicle.)	Inf.	Scopar.	ad	3viiij.				
Misce,	fiat	mist.	-	-	-	-	-	SUBSCRIPTION.
Cpt.	Cochl.	mag.	ii.	4ta.	q.q.	hora	ex paul.	SIGNATURE.

Without abbreviations or contractions it would read thus :—

Recipe

Potassii Acetatis drachmas quinque.

Tincturæ Digitalis drachmam unam.

Syrupi Aurantii unciam unam.

Infusum Scoparii ad uncias octo.

Misce, fiat mistura. Capiat cochlearia duo magna quartâ quâque horâ ex paululo aquæ.

The student should not confound the *initials* of the prescriber with that portion of the prescription called the signature—*i.e.*, the directions to the patient.

The student will find benefit from a careful study of the following pages, in which the Latin of the above prescription is arranged according to the English idiom, and each word parsed and translated.

Latin Idiom.

Recipe Potassii Acetatis drachmas quinque.

R. (Recipe)	..	{ v. irr. tr. im. m. 2nd per. s., to agree with its nom. <i>Tu</i> —“ thou ” (understood). Rule i., recipi-o, recep-i, receptum, recipere. }	Take thou
v (quinque)	..	{ num. adj. indec. ac. pl. qual. and agreeing with drachmas. Rule ii. }	five
ḡ (drachmas)	..	{ n. f. ac. pl. Rule viii. (a) drachma—æ. }	drachms
Acet. (acetatis)	..	{ n. f. gen. s. qual. drachmas. Rule vi. (a), acetas—atis. }	of acetate
Pot. (potassii)	..	{ n. n. gen. s. qual. acetatis. Rule vi. (a), potassium—ii. }	of potassium.

Latin Idiom.

Recipe Digitalis Tincturæ drachmam unam.

R. (Recipe)	..	(understood)	Take thou
j (unam)	..	{ num. adj. ac. s. qual. and agreeing with drachmam. Rule ii., unus—a—um. }	one
ḡ (drachmam)	..	{ n. f. ac. s. gov. by recipe. Rule viii. (a), drachma—æ. }	drachm
Tinct. (tincturæ)	{	n. f. gen. s. qual. drachmam. Rule vi. (a), tinctura—æ.	of the tincture
Digit. (digitalis)	{	n. f. gen. s. qual. tincturæ. Rule vi. (a), digitalis—is.	of digitalis.

Latin Idiom.

Recipe Aurantii Syrupi unciam unam.

R. (Recipe)	..	(understood) ..	..	Take thou
j (unam)	..	(parsed as before) ..	..	one
z̄ (unciam)	..	{ n. f. ac. s. gov. by recipe. Rule viii. (a), uncia—æ.	}	ounce
Syr. (syrupi)	..	{ n. m. gen. s. qual. unciam. Rule vi. (a), syrupus—i.	}	of syrup
Aur. (aurantii)	..	{ n. neu. gen. s. qual. syrupi. Rule vi. (a), aurantium—ii.	}	of orange.

Latin Idiom.

Recipe Infusum Scoparii ad uncias octo.

R. (Recipe)	..	(understood) ..	..	Take thou
Infus.* (Infusum)	{	n. neu. s. acc. gov. by recipe. Rule viii. (a), infusum—i.	}	infusion
Scop. (scoparii)	{	n. masc. gen. s. qual. in- fusum. Rule vi. (a), sco- parius—ii.	}	of broom
Ad	..	prep. gov. uncias. Rule viii. (b)		up to
viiij (octo)	..	{ num. adj. indec. qual. uncias. Rule ii.	}	eight
z̄ (uncias)	..	{ n. f. ac. pl. gov. by ad. Rule viii. (b), uncia—æ.	}	ounces.

⚡ N.B.—The student must have a clear idea of the meaning of this “Ad.” It means that the dispenser, after measuring the other ingredients, must add enough of the infusion to make the entire quantity measure 8 ozs.

Latin Idiom.

Misce, fiat mistura.

M. (misce)	..	{ v. trans. imp. m. p. t. agree- ing with and gov. by tu (understood). Rule i., mis- ceo, -ui, mixtum or mistum, miscere.	}	Mix thou, or mix,
Mist. (mistura)	..	{ n. f. nom. s. governing fiat. Rule i., mistura—æ.	}	let a mixture
Ft. (fiat)	..	{ v. used as passive of facio, pres. sub. 3rd s., used as imp. gov. by and agreeing with mistura; fio, factus sum, fieri; to be made or become.	}	be made.

⚡ * Some authorities put Infusum in the genitive (infusi)—a partitive genitive—i.e., “of infusion.” In the same way, where the student meets *Aquam ad z̄*—, in the different prescriptions throughout the Fourth Part of this work, he may substitute *Aquæ ad z̄*. Either form is correct.

Latin Idiom.

Capiat cochlearia magna duo quartâ quâque horâ ex aquâ paululo.

<i>Cpt.</i> (capiat) ..	{ irr. v. tr. sub. m. pr. t. 3rd per. s. agreeing with and gov. by (is) understood. Rule i., capiō, cepi, captum, capere, the present subjunctive used as an imperative. Rule x. (a). }	He may take, or let him take
<i>ij</i> (duo)	{ num. adj. ac. pl. neut. qual. and agreeing with cochlearia. Rule ii., duo—æ —o. }	two
<i>Mag.</i> (magna) ..	{ adj. ac. pl. neut. qual. and agreeing with cochlearia. Rule ii., magnus—a—um. }	large
<i>Coch.</i> (cochlearia)	{ n. ac. pl. neut. gov. by capiat. Rule viii. (a), cochlear—is. }	spoonfuls
<i>q.q.</i> (quâque) ..	{ pron. indef. abl. s. qualifying and agreeing with hora. Rule ii., quisque, quæque, quodque. }	at each
<i>4tâ</i> (quartâ) ..	{ num. adj. abl. s. qualifying and agreeing with hora. Rule ii., quartus—a—um. }	fourth
<i>Horâ</i>	{ n. f. abl. s. Rule ix. (a), hora —æ. }	hour
<i>Ex</i>	prep. Rule ix. (c).	out of (in)
<i>Paul.</i> (paululo) ..	{ adj. abl. s. used as a noun, gov. by ex. paululus—a— um. }	a little
<i>Aq.</i> (aquæ) ..	{ n. f. gen. s. qual. paululo. Rule vi., aqua—æ. }	of water.

GRAMMATICAL AIDS TO PRESCRIPTION WRITING.

Two languages differ in *words*, *inflections*, and *idioms*.

"A student who wishes to read the Latin language must thus understand the *meaning* of its words, the *force* of its inflections, and the *nature* of its idioms."

As far as the *words* are concerned, a limited knowledge of this language, and one sufficient for the intelligent reading and writing of physicians' prescriptions, may be obtained from the following brief vocabulary.

The *inflections* may be learned from any Latin grammar; whilst the student may obtain a fair conception of the *idioms* or order of words from a careful study of the few important rules of Syntax which follow.

A FEW RULES OF LATIN SYNTAX, APPLICABLE TO THE
CONSTRUCTION OF PHYSICIANS' PRESCRIPTIONS.

Syntax is generally divided into two parts—CONCORD and GOVERNMENT.

Concord is the agreement between two Latin words, one influencing the other. There are three concords :—

1. A verb, with its subject (as Rule I.).
2. Adjectives, with the nouns which they qualify. (Rule II.)
3. The Relative, with its antecedent. (Rule III.)

RULE I.

A personal verb agrees with its subject or nominative, in number and person ; as, *Ego tero*—I rub ; *Tu sumas*—You may take ; *Id fiat*—It may be done.

In prescription writing, the *active* voice of verbs is generally only used in the 2nd person singular of the imperative mood, and 3rd person singular or plural of the present subjunctive.

The use of the *passive* voice is generally confined to the 3rd person singular or plural of the present subjunctive, and the different parts of the Gerundive.

RULE II.

Adjectives, participles, and pronouns, whether belonging to the subject or the predicate, agree in gender, number, and case with the noun or the pronoun to which they refer ; as *Pulvis unus*—One powder ; *Uncia una*—One ounce ; *Sevum Præparatum*—Prepared suet.

RULE III.

The relative must agree with its antecedent in gender, number, and person ; as, *Syrupus qui optimus est*—The syrup which is best ; *Mistura quæ bona est*—The mixture which is good ; *Medicamentum quod neglectum est*—The medicine which has been neglected.

RULE IV.

If a verb has more than one subject the verb must be put in the plural number ; as *Pilula et mistura capiantur*—The pill and mixture are to be taken.

RULE V.

A participle governs the same case as the verb to which it belongs ; as *Augendo quantitatem*—By increasing the quantity.

RULE VI.

The Genitive case primarily signifies the class to which a thing belongs ; therefore—

- (a) It depends on another noun as a notion which it qualifies or determines ; as *pulveris granum*—a grain of powder.

- (b) Or it is used to signify the whole from which a part is taken ; as, *nimum doloris*—too much (of) pain.
- (c) Adverbs of quantity, time, place, etc., govern the Partitive Genitive ; as, *satis aquæ*—enough (of) water.
- (d) Adjectives of plenty or want govern a Genitive or Ablative ; as, *dives quinina*—rich in quinine ; *dives aqua*—rich in water.

RULE VII.

Dative.—The sign of the Dative case is *to* or *for*.

- (a) Adjectives which imply likeness or unlikeness, advantage or disadvantage, etc., govern the Dative ; as, *cere similis*—like to wax.
- (b) Verbs of giving or imparting, etc., govern the Dative of the indirect object as well as the Accusative of the direct object : *contusam liquori redde*—return the bruised (substance) to the liquor.

RULE VIII.

Accusative.—The Accusative was originally used to mark the immediate object of an action.

- (a) Transitive verbs in the active voice generally govern the Accusative case ; as *citratem calcis lava*—wash the citrate of lime.

- (b) The following prepositions govern the Accusative :—

<i>Ad</i> To, at, for.	<i>Inter</i> Between, among.
<i>Adversum, ad-</i> <i>versus</i> Against, towards.	<i>Ob</i> On account of.
<i>Ante</i> Before.	<i>Per</i> Through, by.
<i>Apud</i> At, with.	<i>Pone</i> Behind.
<i>Circum</i> Around.	<i>Post</i> After.
<i>Contra</i> Against.	<i>Prope</i> Near.
<i>Extra</i> Outside.	<i>Secundum</i> ..According to.
<i>Infra</i> Below.	<i>Supra</i> Above.

- (c) The following prepositions govern the Ablative as well as the Accusative :—

<i>In</i> (ac.) Into ; (ab.) in.	<i>Subter</i> (ac. and ab.) Under.
<i>Sub</i> (ac.) Under ; (ab.) near.	

RULE IX.

The Ablative received its name because it signifies ablation or separation, the sign of which is *from*.

- (a) Cause, manner, means, instrument, time when, and place where, are put in the Ablative ; as, *balneo arenæ*—in a bath of sand.

- (b) *Opus* and *usus* are followed by an Ablative ; as, *cibo opus est nobis*—we have need of food.
- (c) The definite answer to the questions “ when ” or “ how ” is expressed by a noun or pronoun and a participle in the Ablative case, and is called the Ablative absolute ; as, *liquoribus omnibus mixtis*—all the liquors having been mixed.

The following prepositions govern the Ablative :—

<i>A, ab, abs</i> .. Away from, by.	<i>Præ</i> Before, because of.
<i>Cum</i> With.	<i>Pro</i> For, before, according to.
<i>De</i> Down from, of, about.	
<i>E, ex</i> Out of, from, after.	<i>Sine</i> Without.

- (d) *Utor, abutor*, and a few other verbs govern the Ablative ; as, *utatur sequenti*—let him use the following.

RULE X.

The Imperative mood is used to express requests or commands ; as, *Recipe*—Take (thou).

- (a) The Present Subjunctive mood is often used instead of the Imperative ; as, *fiat mistura*—let the mixture be made.

LATIN WORDS AND PHRASES MOST FREQUENTLY USED IN PRESCRIPTIONS, BRIEFLY EXPLAINED.*

- Aa, Ana** (Greek preposition). Of each.
- A, ab, prep.** By or from (governs abl.).
- Ad 3tiam vicem**—ad tertiam vicem. For three times.
- Ad lib.**—ad libitum. (*ac.*, *s.*, *libitus-i.* Rule viii.). At pleasure.
- Add.**—Adde, *im. m.* (*addo*, *-didi*, *-ditum*, *-ere*). Add.
- Admov.**—Admove, *im. m.* (*Admoveo*, *-vi*, *-tum*, *-ere*). Apply.
- Æger, ægra, ægrum, adj.** Sick. (The patient.)
- Albus** (*-us*, *-a*, *-um*, *adj.*). White.
- A. H., Alternis Horis.** (*ab. pl.* Rule ix.). Every other hour.
- Alvus** (*-i*, *n. fem.*). The bowels.
- Alvo Adst.**—Alvo Adstrictâ. The bowels being confined.
- Amplus** (*-us*, *-a*, *-um*, *adj.*). Large.
- App.**—Applicandum. (*-us*, *-a*, *-um*, *gerundive.*) To be applied.
- Aq.**—Aqua. (*-æ*, *n. f.*) Water.

* ABBREVIATIONS USED.—*ab.*, or *abl.*, ablative ; *ac.*, accusative ; *ad.*, or *adj.*, adjective ; *adv.*, adverb ; *conj.*, conjunction ; *f.*, feminine ; *gen.*, genitive ; *im.*, or *imp.*, imperative ; *indec.*, indeclinable ; *indef.*, indefinite ; *irr.*, irregular ; *m.*, or *masc.*, masculine ; *m.*, or *mo.*, mood ; *n.*, or *no.*, noun ; *nom.*, or *no.*, nominative ; *num.*, numeral ; *neu.*, neuter ; *pas.*, passive ; *part.*, participle ; *p.*, *pr.*, or *pres.*, present ; *pl.*, plural ; *prep.*, preposition ; *pron.*, pronoun ; *s.*, singular ; *sub.*, subjunctive ; *t.*, tense ; *tr.*, transitive ; *v.*, verb.

- Aq. Bull.**—Aqua Bulliens. (*-entis, adj.*) Boiling water.
Com.— „ Communis. (*-is, -e, adj.*) Common „
Dest.— „ Destillata. (*-us, -a, -um, adj.*) Distilled „
Ferv.— „ Fervens. (*-entis, adj.*) Hot „
Font.— „ Fontalis. (*-is, -e, adj.*) Spring „
Mar.— „ Marina. (*-us, -a, -um, adj.*) Sea „
Niv.— „ Nivalis. (*-is, -e, adj.*) Snow „
Pluv.— „ Pluvialis. (*-is, -e, adj.*) Rain „
Auris (*-is, n. f.*). The ear.
Aut (*conj.*). Or.
Balneum (*-ei, n. neu.*). A bath.
Bene (*adv.*). Well.
Bibo (*bibere v. 3rd. conj.*). To drink.
Bis Ind.—Bis Indies (*adv.*). Twice a day.
B.P. or Ph. B.—Pharmacopœia Britannica, British Pharmacopœia.
Brachium (*-ii, n. neu.*). The arm.
C.—Cum (*prep. gov. abl. See Rule ix.*). With.
Calidus (*-us, -a, -um, adj.*). Warm.
Calor (*-oris, n. masc.*). Heat.
Capio (*See Cpt.*) To take.
Caput (*-itis, n. neu.*). The head.
Cataplasma (*-atis, n. neu.*). A poultice.
Ceratium (*-i, n. neu.*). An ointment or cerate.
Charta (*-æ, n. f.*). A powder or a paper.
Cibus (*-i, n. masc.*). Food.
Circa (*prep. gov. accus.*). Around.
Coch.—Cochlear, Cochleare, or Cochlearium (*n. neu.*). A spoonful.
Coch. Amp.—Cochlear (*-aris*) Amplum (*-us, -a, -um, adj.*). A table-spoonful.
Mag.—Cochlear (*-aris*) Magnum (*-us, -a, -um, adj.*). A large spoonful ; or a table-spoonful.
Med.—Cochlear (*-aris*) Medium or Modicum (*-us, -a, -um, adj.*). A dessert-spoonful.
Min.—Cochlear (*-aris*) Minimum (*-us, -a, -um, adj.*). A small spoonful ; or a tea-spoonful.
Parv.—Cochlear (*-aris*) Parvum (*-us, -a, -um, adj.*). A tea-spoonful.
Cochleat.—Cochleatim (*adv.*). By spoonfuls.
Cœna (*-æ, n. f.*). Supper.
Coll.—Collyrium (*-ii, n. neu.*). An eye-wash.
Colo (*-avi, -atum, -are, v. a.*). To strain.
Co.—Compositus (*-us, -a, -um, adj.*). Compound.
Comp.—Compositus (*-us, -a, -um, part.*). Compounded.
Confectio (*-onis, n. f.*). A confection or electuary.
Cong.—Congius (*-ii, n. masc.*). A gallon.
Conserva (*-æ, n. f.*). A conserve or electuary.
Coq.—Coque (*coquo, -xi, -ctum, -ere, v., im. m.*). Boil.

- Cpt.**—Capiat (*pr. sub.*, 3rd *per. s.*, *capio, cepi, captum, capere*.
Rule x.). Let the patient take.
- Cras** (*adv.*). To-morrow.
- Crus** (*Cruris, n. neu.*). The leg.
- Cuj.**—Cujus (*gen. s. of qui, quæ, quod*). Of which.
- Cum** (*prep. gov. abl.*). With.
- Cyath.**—Cyathus (*-i, n. masc.*). A glass.
- C. Vinar.**—Cyathus Vinarius. A wine-glass.
- D.**—Dosis (*dosis, n. f.*). A dose.
- Da.** {—Da. (*do, dedi, datum, dare, imp. m.*) } Give ;
- Det.** {—Detur. (*pres. sub.*, 3rd *p. s.*) } Let it be given.
- Decoctum** (*-i, n. neu.*). A decoction.
- Decub.**—Decubitus (*-us, -a, -um, part.*). Lying down.
- De d.** {—De die (*-es, -ei, n. masc. ab. s. Rule ix.*) } From day
- in d.** {—in diem. (*Rule viii.*) } to day.
- Dej.** {—Dejectiones (*-onum, n. pl.*) } Stools, or motions of
- Alv.** {—Alvi (*-i, n. f. gen. s.*) } the bowel.
- Dens** (*dentis, n. m.*). A tooth.
- Dexter** (*-tra, -trum, adj.*). Right.
- Dieb.** {—Diebus (*-es, -ei, n. ab. pl. Rule ix.*) } Every
- alt.** {—Alternis (*-us, -a, -um, adj. pl. ab. m. Rule ii.*) } other day.
- Digitus** (*-i, n. m.*). A finger.
- Dim.**—Dimidius (*-us, -a, -um, adj.*). One half.
- Div.**—Divide (*-do, -visi, -visum, -dere, im. m.*). Divide.
- Div.** {—Dividatur (*-vido, -visi, -sum, -ere, v. 3rd*) } Let it be
- in** {—in (*prep. gov. partes. Rule viii. c.*) } divided
- p.** {—partes (*n. ac. pl. gov. by in*) } into
- æq.** {—æquales (*adj., agreeing with partes*) } parts
- Dolor** (*-oris, n. masc.*). Pain.
- Donec** (*conj.*). Until.
- Durant.** {—Durante (*-ans, -antis, part.*) } While the pain
- Dolor.** {—Dolore (*-oris, n. masc.*) } lasts.
- Dos.**—Dosis (*-is, accusative dosin, n. f.*). A dose.
- Drachma** (*-æ, n. f.*). A drachm.
- Dulcis** (*-is, -is, -e, adj.*). Sweet.
- Dum** (*adv.*). Whilst.
- Duo** (*duo, -æ, -o, adj.*). Two.
- E or Ex** (*prep. gov. abl.*). Out of.
- EjUSD.**—Ejusdem (*idem, eadem, idem, gen. s.*). Of the same.
- Effervescentia** (*-æ, n. f.*). Effervescence.
- Elect.**—Electuarium (*-ii, n. neu.*). An electuary.
- Emesis** (*-is, n. f.*). Vomiting.
- Emplastrum** (*-tri, n. neu.*). A plaster.
- Enema** (*-atis, n. neu.*). An enema or clyster.
- Et** (*conj.*). And.
- Extractum** (*-i, n. neu.*). An extract.
- F.**—Fac. (*facio, feci, factum, facere, imp. m., 2nd p. s.*).
 Make.

- M.**—Massa (-æ, n. f.). A mass.
- M.**—Misce (*misceo, miscui, mistum, miscere, pres. imper.*). Mix.
- M. or Min.**—Minimum (-i, n. neu.). A minim.
- Med.**—Medicamentum (-i, n. neu.). A medicine.
- Medius** (-us, -a, -um, adj.). Middle.
- Mensura** (-æ, n. f.). A measure or by measure.
- Meridies** (-ei, n. masc.). Mid-day or noon.
- Mist.**—Mistura (-æ, n. f.). A mixture.
- Mitte** (*mitto, misi, missum, mittere, 2nd p. s. pres. imper.*). Send.
- Modicus** (-us, -a, -um, adj.). Middle-sized.
- Mol.**—Mollis (-e, adj.). Soft.
- More dict.**—More dicto (*more, mos, -ris, n. masc. ; dicto, dico, -xi, -ctum, -ere, participle*). In the manner directed.
- M.D.U.**—More dicto utendum (*utendus, -a, -um ; gerundive of utor*). To be used as directed.
- More Sol.**—More solito (*solitus sum, solere, v. neu. passive*). To be accustomed. In the usual manner.
- Morbus** (-i, n. masc.). Disease.
- M.P.**—Massa Pilularis. A pill mass.
- Nig.**—Niger (-ra, -rum, adj.). Black.
- Nisi** (*conj.*). Unless.
- Nox** (*noctis, n. f.*). Night.
- N.P.**—Nomen Proprium. The proper name.
- Nux** (*nucis, n. f.*). A nut.
- Octarius** (-ii, n. masc.). A pint.
- Oculus** (-i, n. masc.). An eye.
- Oleum** (-ei, n. neu.). Oil.
- Om.**—Omnis (-is, -is, -e, adj.). All ; every.
- Omn. Hor.**—Omni Hora (-æ, n. f.). Every hour.
- Omn. Quadr. Hor.**—Omni Quadrante Horæ (*Quadrans, -tis, ab. f.*). Every quarter of an hour.
- Ope** (*ops, opis, n. f. ab. s.*). Rule ix. (a). By the aid of.
- Optimus** (-us, -a, -um, adj.). Best.
- Opus** (*indeclinable n. neu.*). Need or occasion.
- Pars** (-tis, n. f.). A part.
- P. Æ.**—Partes Æquales (-is, -is, -e, adj.). Equal parts.
- Parvulus** (-us, -a, -um, adj.). Very little.
- Paul.**—Paululus (-us, -a, -um, adj.). Little.
- Parvus** (-us, -a, -um, adj.). Little ; small.
- Pectus** (-oris, n. neu.). The breast.
- Per** (*prep. governs acc.*). Through.
- Pes** (*pedis, n. masc.*). The foot.
- Pil.**—Pilula (-æ, n. f.). A pill.
- Pocul.**—Poculum (-i, n. neu.). A cup ; a little cup.
- Pollex** (-icis, n. masc.). The thumb.
- Pone** (*prep. gov. acc.*). Behind.
- Post** (*prep. gov. acc.*). After.
- Postea** (*adv.*). Afterwards.
- Post singulas dejectiones liquidas.** After each loose motion.

- P.P.A.**—*Phiala prius agitata* (*ablative absolute*). The bottle having been first shaken.
- Prandium** (*-ii, n. neu.*). Dinner.
- Primus** (*-us, -a, -um, adj.*). First.
- P.R.N.**—*Pro re nata* (*adverbial phrase*). Occasionally, or according to circumstances.
- Pro** (*prep. gov. abl.*). Before.
- Pulmo** (*-onis, n. masc.*). A lung.
- Pulv.**—*Pulvis* (*-veris, n. masc.*). A powder.
- Q.Q.**—*Quaque f. or Quoque masc.* (*quisque, quæque, quodque, abl. s. indef. prn.*). Each or every.
- Q.S.** {—*Quantum* (*adv.*). } As much as is
 {—*Sufficiat* (*sufficio, -feci, -fectum, -ere*). } sufficient.
- Quaque Hora** (*abl. of quisque, quæque, quodque, pron.*). Each hour.
- Quartus** (*-us, -a, -um, adj.*). Fourth.
- Quintus** (*-us, -a, -um, adj.*). Fifth.
- Quor.**—*Quorum* (*qui, quæ, quod, pron.*). Of which.
- Quater** (*adv.*). Four times.
- Quibus** (*qui, quæ, quod, rel. pron. abl. pl.*). From which.
- Quotidie** (*adv.*). Daily.
- R.**—*Recipe* (*recipio, recepi, receptum, recipere, im. m.*). Take thou.
- Rad.**—*Radix* (*-icis, n. f.*). A root.
- Rec.**—*Recens* (*-ens, -ens, -ens, adj.*). Fresh.
- Rept.** {—*Repetatur* (*repeto, -ivi, -itum, -ere, sub. m. 3rd s.*). } Let it be repeated.
 {—*Repetantur* (*3rd pl.*). } Let them be repeated.
- S.A.**—*Secundum Artem* (*secundum, prep.; ars, artis, n. f.*). According to Art.
- Sæpe** (*adv.*). Often.
- Scrupulus** (*-i, n. masc.*). A scruple.
- Secundus** (*-us, -a, -um, adj.*). Second.
- Sem.**—*Semen* (*-inis, n. neu.*). Seed.
- Semiuncia** (*-æ, n. f.*). A half-ounce.
- Separatim** (*adv.*). Separately.
- Sesquih.**—*Sesquihora* (*sesquihora, -æ, n. f.*). An hour and a half.
- Sextus** (*-us, -a, -um, adj.*). Sixth.
- Si** (*conj.*). If.
- Sig.**—*Signa* (*signo, -avi, -atum, -are, im. m.*). Mark thou.
- Simul** (*adv.*). Together; at the same time.
- Sine** (*prep.*). Without (*gov. abl.*).
- Sing.**—*Singulorum* (*singulus, -a, -um, adj.*). Of each.
- Si op. sit**—*Si opus sit*. If necessary.
- Sit** (*sum, fui, esse, p. sub.*). Let it be.
- S.N.**—*Secundum Naturam* (*-a, -æ, n. f.*). According to nature.
- Solve** (*solvo, solvi, solutum,olvere*). Dissolve.
- Somnus** (*-i, n. masc.*). Sleep.

- Spt.**—Spiritus (*-us, n. masc.*). Spirit.
Ss.—Semis (*-is, -issis, n. masc.*). A half.
S.S.—Statim Sumendum. To be taken immediately.
St.—Sumat (*sumo, sumpsit, sumptum, sumere, pr. sub.*). Let him take.
Stat.—Statim (*adv.*). Immediately.
Sub (*prep. gov. acc. or abl.*). Under.
Subinde (*adv.*). Frequently.
Suc.—Succus (*-i, n. masc.*). Juice.
Sum.—Sume (*sumo, sumpsit, sumptum, sumere, im. m.*). Take.
Super (*prep. gov. acc. or abl.*). Over.
Supra (*prep. gov. acc.*). Above.
Syrupus (*-i, n. masc.*). Syrup.
Talis (*talis, talis, tale, adj.*). Such.
Ter (*adv.*). Thrice.
Tere (*tero, trivi, tritum, terere, im. m.*). Rub.
Tertius (*-us, -a, -um, adj.*). Third.
Thorax (*-acis, n. masc.*). The chest.
Tr. or Tinct.—Tinctura (*-æ, n. f.*). A tincture.
Trit.—Tritura (*trituro, triturare, im. m.*). Triturate ; grind.
Tussis (*-is, n. f.*). A cough.
Una (*adv.*). Together.
Uncia (*-æ, n. f.*). An ounce.
Ungt.—Unguentum (*-i, n. neu.*). An ointment.
Unus (*-a, -um, adj.*). One.
Ut. Dict.—Ut Dictum. As directed.
Utend.—Utendum (*-us, -a, -um, gerundive*). To be used.
Vac. Ven.—Vacuo Ventriculo (*adj. and n., ab. sing.*). Rule ix.
 (*a.*) On an empty stomach.
Vel (*conj.*). Or.
Vena (*-æ, n. f.*). A vein.
Venenum (*-i, n. neu.*). Poison.
Ver.—Verus (*-us, -a, -um, adj.*). Genuine.
Vesicatorius (*-us, -a, -um, adj.*). Blistering.
Vesp.—Vesper (*-eris, n. masc.*). The evening.
Vetus (*-us, -us, -us, adj.*). Old.
Vices (*n. f. defective*). Time.
Viginti (*numeral adj. indec.*). Twenty.
Vinum (*-i, n. neu.*). Wine.
Virus (*-i, n. neu.*). Poison.
Vitellus (*-i, n. masc.*). Yolk (*i.e.*, of egg).
Vomicus (*-us, -a, -um, adj.*). Nauseating.
Vomitus (*-us, n. masc.*). A vomit.
Vulnus (*-eris, n. neu.*). A wound.

8 COLLEGE SQUARE NORTH,
BELFAST.

Mr James Smythe

R_x. Ext. Cascar. Sag. Liq. 3ij.
 Fr. Nuc. Vom. 3iv.
 Spt. M. Pip. 3ii.
 Glycerinum ad 3iv^m.
 Ft. Mist. Cpt. Coch. min.
 om. vespere ex paul. Aq.

R_x. Ungt. Conii gr. L.
 Menthol gr. ix.
 Ol. Theobrom. q. s. ut
 ft. Suppos. xii. Aq.
 i. utend. h. s. om. n.
 Mitte Sod. Tart. 3ss. S.S.
 ex aq. 1-12-02. W.W.

SPECIMEN PRESCRIPTION.

The preceding recipe may be taken as a sample of a physician's prescription, and the student will do well to carefully study the various contractions and compare them with the Latin words which they represent.

MR. JAMES SMYTHE.

Recipe

Extracti Cascaræ Sagradæ Liquidi, uncias duas.
Tincturæ Nucis Vomicæ, drachmas quatuor.
Spiritus Menthæ Piperitæ, drachmas duas.
Glycerinum, ad uncias quatuor.

Misce.

Fiat Mistura. Capiat cochleare minimum omni vespere ex paululo aquæ.

Recipe

Unguenti Conii, grana quinquaginta.
Menthol, grana novem.
Olei Theobromatis, quantum sufficiat ut fiat suppositoria duodecim æqualia, unum utendum hora somni omni nocte.

Mitte Sodæ Tartaratæ semiunciam, statim sumendam ex aqua.

W. W.

1/12/1902.

MR. JAMES SMYTHE.

Take of

Liquid Extract of Cascara Sagrada, two ounces.
 Tincture of Nux Vomica, four drachms.
 Spirit of Peppermint, two drachms.
 Glycerin, to four ounces.

Mix.

Make a mixture. Take one tea-spoonful every evening in a little water.

Take of

Ointment of Conium, fifty grains.
 Menthol, nine grains.
 Oil of Theobroma, a sufficient quantity that twelve equal suppositories may be made, one to be used at bed-time every night.

Send half an ounce of Tartarated Soda, to be taken immediately in water.

W. W.

1/12/1902.

GROUPS OF THERAPEUTIC AGENTS.

As the *junior* student will be frequently meeting in the portion of this work under the heading "*Materia Medica*" with words whose meaning he cannot understand, the following brief glossary is inserted here, not as an attempt to classify remedies, but merely for facility of reference, in order to explain terms in constant use which apply to many groups of well-known remedies.

A complete therapeutical classification of drugs is not yet possible. The attempts of Buchheim and Schmiedeberg are in many details unsatisfactory and sometimes misleading.

There are *two* well-recognised and often-mentioned effects of a remedy—the physiological or pharmacological and the therapeutical—and the student should be familiar with both these terms.

By the physiological action of a medicine is generally meant the effects which the medicine will produce when administered to a person in *health*; though it should be remembered that to produce these effects a perfectly healthy state is not *necessary*. Thus, if 10 or 20 grains of quinine be administered to a perfectly healthy subject, the constitutional effect of the remedy soon shows itself in the characteristic group of symptoms called cinchonism. This is spoken of as the physiological or pharmacological action of quinine. If an ordinary medicinal dose of this drug be administered to a patient ill with the ague or neuralgia, it will be found to remove the disease; this is the therapeutical effect of the remedy. Suppose, however, the dose be a very large one, as in the first instance, the remedy may produce cinchonism, even though the patient have ague or neuralgia, and in this case the effects would still be called physiological. It will thus be understood that, in administering a remedy in disease, the physician often desires it to be given in such a quantity that the *physiological* effects of the drug should be made evident, as in treating syphilis with mercury, chorea with arsenic, paralysis with strychnine, or pertussis with belladonna.

To discuss the different theories which have from time to time prevailed about the way in which medicines produce their effects in the system, is beyond the intention of a short work like this. Under the name of each drug, in the Therapeutical section of this book, will be found a description of the way in which each is known or supposed to act. It will be hardly necessary to remind the student that the great bulk of remedies, after being swallowed, speedily find their way into the circulating fluid, accelerated or retarded by their crystalloid or colloid nature, and the well-known laws of osmosis. By the blood they are carried to the different tissues or glands, upon

which they produce their characteristic effects, and by which, in many instances, they are eliminated or thrown out of the body. Why they exercise their peculiar selective power over these particular tissues and organs is a difficult question, but the trend of opinion is certainly in the direction of regarding all such actions as being purely *chemical*. The general relationship between chemical *constitution* and pharmacological action first made manifest by the researches of Crum Brown and Fraser, strongly supports the chemic theory. These observers found that by altering slightly the structure of the strychnine molecule by the introduction of the radical methyl, its convulsing was changed into a paralysing action.

There are several terms constantly employed in the description of the actions of drugs which are unfortunately used in different senses by different writers. The *local* or *direct* action of a drug is seen in the case of swallowing a corrosive poison which injures the mucous lining of the stomach. Its *remote* or *indirect* action would be seen in the stoppage of the heart which might result from its *secondary* influence upon the nerves and circulation. The *primary* or *immediate* action of a dose of croton oil would be to clear out the intestinal canal, its *secondary* or *remote* action might be to remove dropsical effusion in the brain or cellular tissue, or to relieve uræmia.

Absorbents are drugs like wood charcoal, which are used for causing absorption of irritating secretions on the surface of the body, or of gaseous products in the digestive tract.

Acids.—Though these are always regarded as a group of remedies belonging to a chemical classification, the additions to our knowledge of the effects of acid substances justify the mention of them as a group in a therapeutical list. They are medicines which, in the concentrated form, act mostly as caustics, and when given in medicinal doses possess the power of *checking the acid secretions* of the body with which they come in contact, and, at the same time, they directly *increase alkaline secretions*. It is by this theory that Ringer explains their use in acid dyspepsia, sweating, etc. The principal members of the group are hydrochloric, acetic, nitric, sulphuric, phosphoric, nitro-hydrochloric, and citric acids.

Alkalies or Antacids.—Under this head are included substances which have the power of *checking alkaline* and stimulating or *increasing acid secretions*. The most important are—caustic soda and potash, with their carbonates, bicarbonates, acetates, and citrates; ammonia and magnesia, with their preparations. Of this class, there are those which act *directly*, as soda does upon the gastric membrane, and those which also act *indirectly* through the blood.

Alteratives are a class of remedies which, when administered in the ordinary medicinal dosages, cure disease without pro-

ducing any obvious impression on any of the organs of the body; and because the way in which they act is not understood, or capable of demonstration, in the present state of our ignorance, they are said to *alter* the morbid processes, and hence are called "Alteratives." The most important of this class are antimony, mercury, arsenic, iodine, colchicum, and their preparations. They may be regarded as the survivors of the old empiric class of "Specifics," though they still remain amongst the most valuable of our therapeutic agents.

Anaphrodisiacs are medicines which weaken the sexual functions, as camphor, bromides of ammonium and potassium, tobacco, hemlock, iodides of sodium and potassium.

Anæsthetics are medicines which produce loss of sensation and consciousness from their effects upon the brain and spinal centres. The term is usually restricted to volatile substances like chloroform, ether, bromoform, nitrous oxide gas, etc., and does not include narcotics like alcohol and opium, which likewise produce anæsthesia.

Anæsthetics (*Local*) are agents which, when applied directly to a part, destroy its sensibility by their action on the sensory nerves, without injuring the tissues—as ether in the form of spray, cocaine, carbolic acid, ice, veratrine, etc.

Analgesics or Anodynes are remedies which relieve pain by their action on the brain, or their influence over the conductivity of the sensory nerve fibre, as opium, Indian hemp, belladonna, aconite, chloroform, antifebrin, antipyrine, etc.

Anhidrotics are medicines which restrain profuse perspiration. They act by (1) paralysing the terminals of the nerves going to the sweat glands, or (2) by their influence upon the gland cells, or (3) upon the sweat centres, or (4) upon the circulation, as belladonna, atropine, hyoscyamus, stramonium, muscarine, quinine, zinc salts, the vegetable and mineral astringents, and picrotoxin in small doses.

Antacids. (See Alkalies.)

Anthelmintics, Vermifuges, Vermicides, or Antiscolics are medicines which destroy or cause the expulsion of worms, as santonin for the *round* worm, kousso, kamala, male-fern, turpentine, areca nut, and pomegranate for the *tape* and *broad* worms, injections of salt, tannin, quassia, alum, iron, lime-water, etc., for the *thread* worm, and thymol for the *ankylostoma* parasite.

Antagonists are medicines which act in direct opposition to each other, as atropine and muscarine; atropine and hydrocyanic acid; atropine and physostigmine; atropine and pilocarpine; digitalin and saponin; chloral and strychnine; opium and belladonna; alcohol and strychnine.

Antidotes are medicines that relieve or remove the symptoms caused by poisons. Antidotes are *chemical*, as lime for sulphuric acid ; *physiological*, as strychnine for woorara ; or *vital*, as mercury for syphilis.

Antilithics or Lithontriptics are medicines supposed to possess the power of dissolving various concretions in the body, as the acids for phosphatic, and the alkalies for uric acid calculi ; and Castile soap and salicylate of soda for gall-stones.

Antiparasitics are medicines which destroy minute parasitic organisms, assulphurous and carbolic acids, iodide of sulphur, and various mercurial salts, and the innumerable list of antiseptics.

Antiperiodics are medicines which antagonise the poison of periodic disorders like ague. The principal members of the group are quinine, arsenic, and iodine.

Antiplegistics are remedies which are supposed to possess the power of subduing inflammations—as mercury, aconite, veratrum viride, purgatives, antimony, venesection, etc.

Antiseptics are medicines which prevent putrefaction by destroying or arresting the growth and development of the germs, upon whose presence putrefaction depends. Carbolic acid may be taken as the type of this class. They should not be confounded with Disinfectants like hot air, which destroy the germs causing disease, or with Deodorants like chlorine or charcoal, which destroy fetid smells and emanations. Some of the newer antiseptics, as urotropin, act on the renal secretion after being eliminated by the kidney from the blood.

Antisialics are remedies used to diminish or check the secretions of the salivary glands, as atropine, and physostigma in large doses.

Antipyretics are remedies which reduce the temperature in fevers and diseased conditions. They do so either (1) by *lessening* thermogenesis or heat production through their effect on the nervous system, as antipyrine, antifebrin, quinine, salicin, etc., or (2) by destroying the poison which causes the fever, as arsenic and iodine in ague, or (3) by *increasing heat dissipation* through their action on the skin or circulation, as alcohol, antimony, aconite, etc., or (4) they may act by *heat abstraction*, as the cold bath and large doses of diaphoretics and sudorifics do.

Antispasmodics.—Several distinct groups of remedies are included under this heading.

(1) Medicines which *paralyse* the motor centres or nerves, as Calabar bean, chloroform, and woorara, or which merely *depress* them, as bromides of potassium and ammonium.

(2) Medicines which produce profound general depression of all the vital functions, as tobacco, aconite, lobelia, hellebore, prussic acid ; and many remedies called sedatives.

(3) Medicines which, by stimulating the bowel, cause the expulsion of gas and relieve colic, as asafetida, cajuput, castor, valerian, and a host of remedies called Carminatives and Aromatics.

(4) Medicines which overcome spasm of the bronchial tubes, as stramonium, belladonna, hyoscyamus, etc.

Aphrodisiacs are medicines which increase the sexual appetite and excite the functions of the genital organs, as phosphorus, cantharides, strychnine, damiana, cannabis indica, etc. They act directly upon the genital nerve centres in the cord and brain, as strychnine, or indirectly by irritating the bladder and urethra, as cantharides.

Astringents are remedies which cause contraction of muscular fibre, and condensation of the tissues, mostly by precipitation of gelatin and albumin. The most important are tannic and gallic acids, and all substances containing them, the mineral acids and most metallic salts, alum, creosote, etc.

Carminatives. (See Antispasmodics.)

Cathartics, Aperients, Evacuants, or Purgatives are medicines which increase or quicken the evacuations from the bowel. They are variously subdivided :—

(a) *Laxatives*, which slightly quicken the peristaltic movements, and cause only *softened* motions, as manna, sulphur, figs, prunes, olive oil, etc.

(b) *Purgatives proper or simple purgatives*, which, by increasing the movements of the intestines, and mildly stimulating the glands, cause *semi-fluid* motions, as senna, castor oil, mercurials, aloes, etc.

(c) *Drastics*, which act like the former class, only more intensely, and by their local irritant action increase the intestinal fluid, and remove the serum from the intestinal vessels, causing *painful fluid* motions—as scammony, jalap, colocynth, gamboge, podophyllin, and large doses of class (b).

(d) *Hydragogues*, which cause *free* secretion from the intestinal glands, and remove much serum from the bloodvessels, producing *fluid or watery* motions, as croton oil, elaterin, and many of the remedies in class (c) ; and large doses of various salts, like cream of tartar, Epsom, Glauber, etc., which are often called *saline* purgatives, and which are supposed to act by virtue of their low diffusive powers.

(e) *Cholagogue Purgatives* are remedies which are supposed to purge by stimulating the liver and increasing the bile, or by concentrating their action upon the duodenum they cause the bile to be swept out of the body before it has time to be re-absorbed by the intestinal surface (calomel and podophyllin) ; they produce *greenish liquid* motions ; most brisk purgatives are included in this class by writers, as aloes, iridin, mercurials, rhubarb, euonymin, etc.

Vegetable cathartics are classified upon a chemical basis by Cushney :—

(1) *Anthracene Purgatives*.—These all contain principles which are derivatives of anthraquinone.

(2) *Purgative Oils*, as represented by croton oil and castor oil.

(3) The Jalap Group, which are all resinous bodies, as jalap, scammony, gamboge, podophyllin, and colocynth.

Cholagogues.—The term is sometimes used to include such mild hepatic stimulants as the dilute nitro-hydrochloric acid, soda salts, and the chloride of ammonium. It should not be confounded with the class of cholagogue purgatives, many of which are true cholagogues when used in doses too small to cause any purgative action.

Ciliary Excitants are medicines which, when sucked in the mouth, promote expectoration of bronchial mucus by reflex action—as chloride of ammonium, chlorate of potassium, gum acacia, native chloride of sodium, etc.

Counter-Irritants.—Under this heading are included—RUBEFACIENTS, remedies which cause redness of the skin ; EPI-SPASTICS, or VESICANTS, which produce inflammation, ending in the formation of a blister ; REVULSIVES and DERIVATIVES—remedies which are supposed to remove the diseased action from the seat of mischief to the place of their application. Amongst this class are cantharides, turpentine, ammonia, camphor, mustard, most volatile oils, mezereon, capsicum, croton oil, etc.

Demulcents are medicines which protect the parts with which they come in contact, by their oleaginous or mucilaginous qualities, shielding them from irritating secretions. Linseed, olive, and almond oils, starch, glycerin, liquorice, etc., are included under this head.

Diaphoretics are medicines which increase the cutaneous secretion, either by stimulating the terminal nerves in the cells of the sweat glands, as pilocarpine does, or by causing the dilatation of the superficial capillaries, as antimony, ipecacuanha, and all depressing remedies ; or by stimulating the sweat centres in the spinal cord, as the spirit of nitrous ether.

Delirifacients are drugs which produce delirium, followed afterwards by stupor, as cannabis, belladonna, and hyoscyamus.

Diluents are remedies like water and weak fluid foods, which, when taken in quantity, on being eliminated, carry out some solids with them by the kidneys, lungs, or skin.

Digestants or Digestives are agents used to assist the stomach and intestines in their normal functions of digestion of foods. They are papain, pepsin, trypsin, taka-diastase, and malt extract.

Disinfectants and **Deodorants** are referred to under Antiseptics.

Diuretics are remedies which increase the renal secretion. *Stimulating diuretics* act by stimulating the kidneys during their elimination, as copaiba, cubebs, turpentine, pepper, gin, alcoholic liquors, buchu, cantharides, juniper, etc. *Hydragogue diuretics* act by raising the blood pressure in the glomeruli, as digitalis, squill, casca, broom, caffeine, etc. *Refrigerant diuretics* act by washing out the kidneys, as large doses of diluents, like water, and solutions of the various potash salts.

Ecbolics are medicines which cause contraction of the uterine muscular fibre, as ergot, borax, savin, quinine, etc. ; in smaller doses they are emmenagogue.

Emetics are medicines which cause the evacuation of the contents of the stomach. They are divided into (1) *Local* Emetics as zinc and copper sulphates, mustard, carbonate of ammonia, tepid chamomile infusion, and solution of common salt, alum, etc., which act locally by directly irritating the nerves distributed to the gastric mucous membrane. (2) *General* Emetics, which act through the blood upon the vomiting centre, as tartar emetic, ipecacuanha, senega, squill, and apomorphine. Most of these latter drugs are eliminated by the gastric mucous membrane after absorption, and then also act partly as local emetics. Apomorphine may, however, be regarded as a pure general emetic.

Emmenagogues are medicines which, by their stimulating action on the uterus, (1) directly assist in restoring disordered menstruation, as ergot, savin, and most ecbolics ; or (2) by removing the cause of the suppression, allow the discharge to return, as iron, aloes, strychnine, etc.

Emollients or Protectives are external Demulcents, which protect and soothe the parts to which they are applied from all sources of irritation ; or, by their oily nature, they help to relax and soften the tissues, as poultices, oils, lard, spermaceti, hot fomentations, chalk, starch, etc.

Errhines are medicines which increase the secretion of the nasal mucous membrane generally without causing sneezing, as the vapour of ammonia, acetic acid, etc. The term is, however, often applied also to sternutatories.

Escharotics or Caustics are substances which destroy the life of the tissue to which they are applied, generally by depriving it of its moisture—as the strong mineral acids, soda, potash, lime, arsenic, chloride of zinc, etc.

Expectorants are medicines which assist the expulsion of the bronchial mucus—

(1) By relieving spasm of the bronchial tubes, as lobelia, stramonium, tobacco, etc.

(2) By mechanically dislodging it in the act of vomiting, at the same time thinning the secretion, as all emetics *in large doses*, notably antimony, hippo, etc.

(3) By increasing the flow from the inflamed membrane, through their effects upon its gland cells, as all the emetic class *in small doses*—*Nauseating* or *Depressant* expectorants—as apomorphine, pilocarpine, emetine, and tartar emetic.

(4) By stimulating the membrane in the act of their elimination, they so alter the secretion that expectoration is rendered easy, as ammonia, senega, ammoniacum, and a host of volatile substances, notably the onion, tar, turpentine, balsams, asafetida, etc.—*Stimulating* expectorants. Iodide of potassium, by liquefying the secretion, is a valuable expectorant.

(5) By soothing the irritable respiratory centre, morphine and chloral may act as expectorants, and render the expulsion painless, but this effect should never be counted upon, since these sedatives depress the respiratory centre and prevent coughing; they should be regarded as agents for the relief of unnecessary cough, but not as true expectorants.

(6) By acting through the impression produced on the nerves of the mouth, many substances aid expectoration. (See Ciliary excitants.)

(7) By stimulating the respiratory centre, and strengthening the muscles of the expulsive mechanism, strychnine and atropine may act as true expectorants.

Galactagogues are medicines which increase the secretion of the mammary glands, as chlorate of potassium, fennel, etc.

Hæmatics or Hæmatinics are medicines which enrich the blood by acting as restoratives to the red corpuscles, as iron and its preparations, manganese, cod liver oil, free phosphorus and lime phosphates, and potassium in small doses. They are also termed Blood Tonics.

Hæmostatics are drugs which check hæmorrhage after they have been absorbed and circulate in the blood. Adrenalin—the active principle of suprarenal gland—gelatin and chloride of calcium are the best examples. Ergot, tannin, turpentine and lead salts were supposed to act in the same way.

Hypnotics or Soporifics are medicines which induce sleep without causing any previous cerebral excitement. Sulphonal, trional, chloral, paraldehyde, urethane, and the new sleep producers belong to this class.

Mydriatics are remedies which cause dilatation of the pupil, paralysis of the ciliary muscle, and temporary loss of accommodation, as atropine, duboisine, belladonna, homatropine, daturine, etc.; they are generally used for their local action.

Myotics are remedies which cause contraction of the pupil and diminution of ocular tension, as eserine, Calabar bean, pilocarpine, etc.

Narcotics are medicines which produce sleep by their action upon the cerebrum. They are to be distinguished by their initial exciting stage from pure Hypnotics, like trional and bromide of potassium, etc.; amongst them are opium, morphine, chloroform, Indian hemp, alcohol, and ether.

Nervines are agents which act upon the nervous system. The term includes narcotics, anæsthetics, hypnotics, excitomoters, etc.

Oxytocics are medicines employed to increase the activity of the uterine contractions during or immediately after labour, as quinine, ergot, and hydrastis.

Refrigerants are medicines which reduce the temperature of the body in fever; the term, however, is generally applied to a class of remedies which appear to allay thirst by stimulating the mucous glands in the mouth and pharynx, as the vegetable acids, some mineral acids (much diluted), and many diaphoretics. (See Antipyretics.)

Resolvents or Discutients are medicines which are supposed to cause the absorption of inflammatory or other swellings. They appear to act by stimulating the lymphatics, as iodine, ammoniacum, etc.

Restoratives are medicines which exist already in the healthy blood or tissues, and are given in diseases where the system is supposed to be deficient in them, as iron, potash, phosphorus, chloride of sodium, etc. They are identical with Hæmatinics (which see).

Rubefacients. (See Counter-irritants.)

Sedatives or Depressants are medicines which depress the action of the (1) nerve centres, as tobacco, lobelia, bromide of potassium, etc.; (2) the circulatory system, as aconite, veratrum, tartar emetic, prussic acid, etc.; (3) the spinal cord, as Calabar bean, etc.

Sialagogues are medicines which increase the secretion of the salivary glands, either by a local irritation of the mouth, causing reflex activity of the glands, as pellitory, mezereon, tobacco, mustard, capsicum, etc.; or by exciting the glands during their elimination, as pilocarpine, muscarine, all the preparations of mercury, iodide of potassium, etc.

Sternutatories are substances which, by their local irritating action on the nasal mucous membrane, cause sneezing, as tobacco, hellebore, ginger, capsicum, and ipecacuanha, in powder.

Stimulants.*—Under this head may be included a great number of remedial agents. The subdivisions are vague and misleading ; thus there are medicines which excite the spinal cord, as strychnine, phosphorus, etc. ; such are called spinal stimulants ; others exalt the functions of the liver, as chologogues ; others the intestines, as calomel, Epsom salt, etc. ; others the circulatory system, as digitalis, belladonna, etc. ; others the stomach, as carminatives, and spices, etc. ; others the skin. These latter are called external stimulants, and include all the Counter-irritants.

Stomachics are medicines which increase the vascularity of the stomach, promote digestion, and increase the appetite, as the carminative group, all the bitter tonics, arsenic, and aloes, in small doses, etc.

Styptics are medicines which arrest bleeding by their local astringent action, either by causing coagulation of the blood, or by acting on the muscular tissue of the small vessels. Amongst this class will be found suprarenal gland substance, tannic acid, creosote, alum, chloride of zinc, perchloride of iron, etc.

Sudorifics. (See Diaphoretics.)

Tonics are, strictly speaking, medicines which improve the tone of the part upon which they act ; thus it may be on the stomach, as the pure vegetable bitters and all stomachics ; or on the cord, as strychnine ; or on the heart, as digitalis ; or on the nervous system, as quinine and the valerianates ; or on the muscular tissues, as tannic acid ; or on the circulating fluid, as iron.

Vermicides and Vermifuges. (See under Anthelmintics.) The term "vermicide" is sometimes restricted to a drug which causes the death of the worm, while "vermifuge" is applied sometimes to any drug which causes the expulsion of the worm, though it may not have power to cause its death.

Vesicants. (See Counter-irritants.)

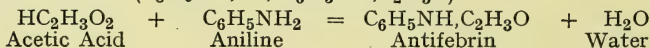
* The term "Stimulants" is frequently erroneously used as a synonym for alcohol and its preparations, which should be regarded as true narcotics.

PART III.

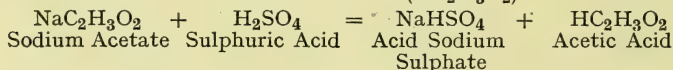
MATERIA MEDICA.

CHEMICAL REACTIONS OF THE OFFICIAL REMEDIES.

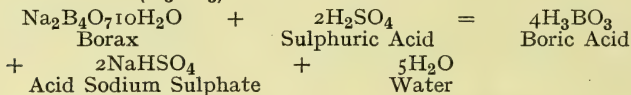
Acetanilidum (C_8H_9NO , or, C_6H_5NH, C_2H_3O).



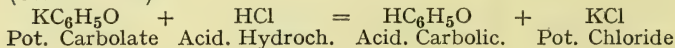
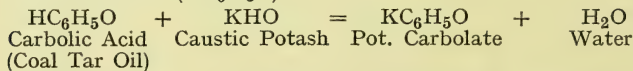
Acid. Aceticum and Acid. Acet. Glac. ($HC_2H_3O_2$).



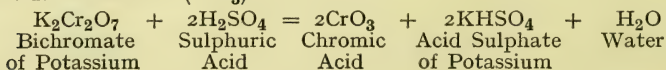
Acid. Boricum (H_3BO_3).



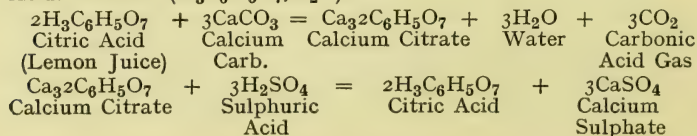
Acid. Carbolicum (HC_6H_5O).



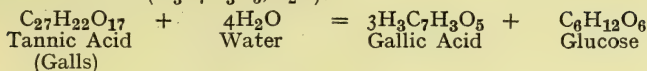
Acid. Chromicum (CrO_3).



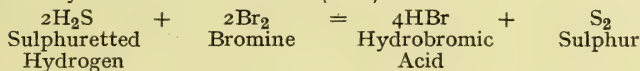
Acid. Citricum ($H_3C_6H_5O_7, H_2O$).



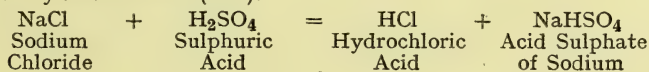
Acid. Gallicum ($\text{H}_3\text{C}_7\text{H}_3\text{O}_5, \text{H}_2\text{O}$).



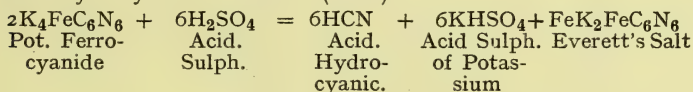
Acid. Hydrobromicum Dilutum (HBr).



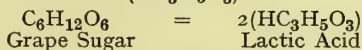
Acid. Hydrochloricum (HCl).



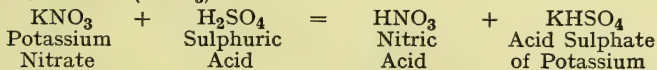
Acid. Hydrocyanicum Dilutum (HCN).



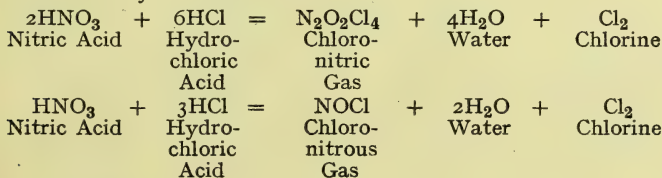
Acid. Lacticum ($\text{HC}_3\text{H}_5\text{O}_3$).



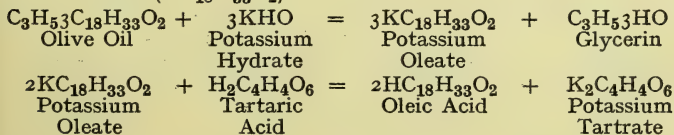
Acid. Nitricum (HNO_3).



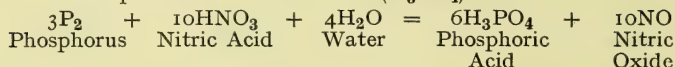
Acid. Nitro-Hydrochloricum Dilutum.



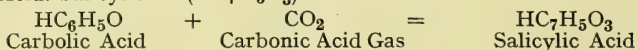
Acid. Oleicum ($\text{HC}_{18}\text{H}_{33}\text{O}_2$).



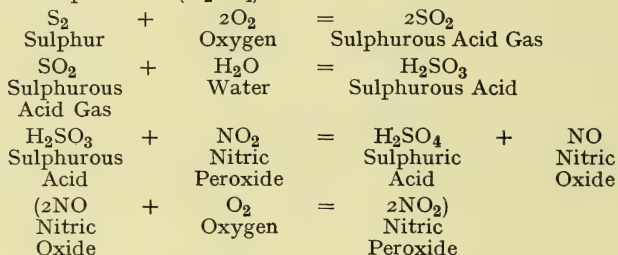
Acid. Phosphoricum Concentratum (H_3PO_4).



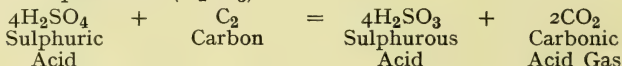
Acid. Salicylicum ($\text{HC}_7\text{H}_5\text{O}_3$).



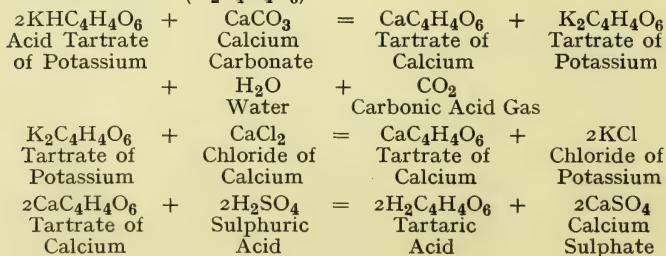
Acid. Sulphuricum (H_2SO_4).



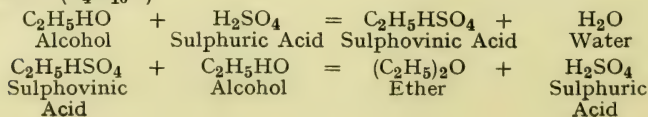
Acid. Sulphurosum (H_2SO_3).



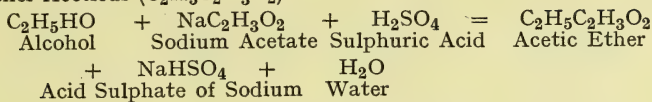
Acid. Tartaricum ($\text{H}_2\text{C}_4\text{H}_4\text{O}_6$).



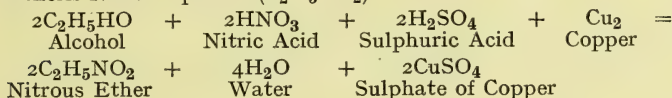
Æther ($\text{C}_4\text{H}_{10}\text{O}$).



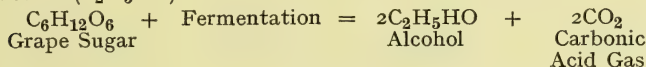
Æther Aceticus ($C_2H_5C_2H_3O_2$).



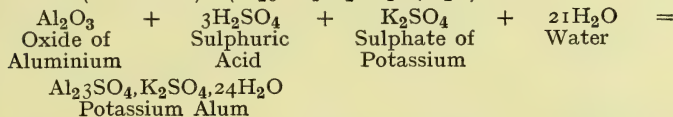
Ætheris Nitrosi Spiritus ($C_2H_5NO_2$).



Alcohol (C_2H_5HO).



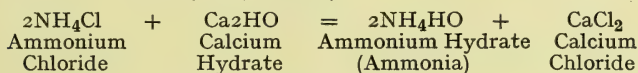
Alumen—(Potassium)—($Al_2SO_4, K_2SO_4, 24H_2O$).



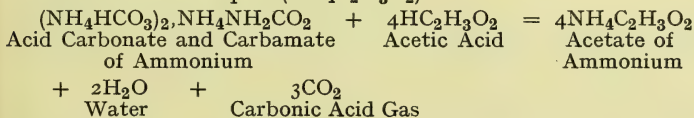
Alumen—(Ammonium)—($Al_2SO_4, (NH_4)_2SO_4, 24H_2O$).

As above, substituting $(NH_4)_2SO_4$ for K_2SO_4

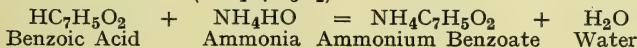
Ammoniaë Fortis Liquor (NH_4HO).



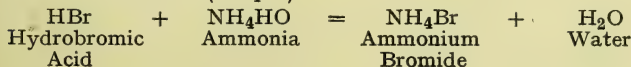
Ammonii Acetatis Liquor ($NH_4C_2H_3O_2$).

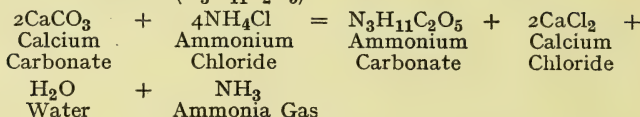
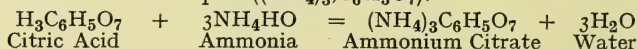
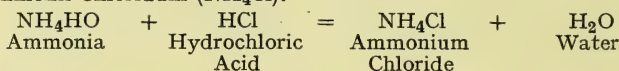
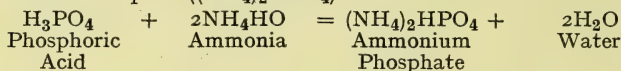
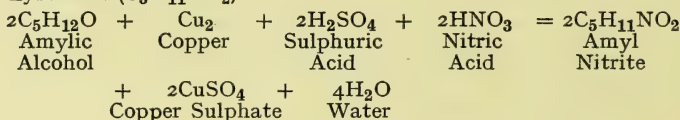
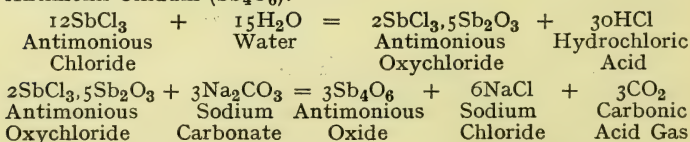


Ammonii Benzoas ($NH_4C_7H_5O_2$).



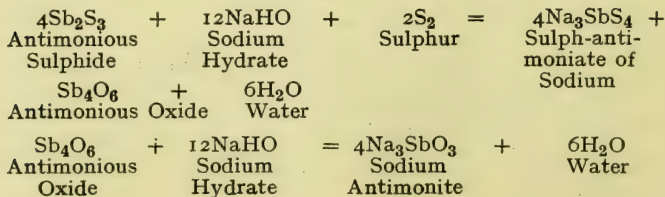
Ammonii Bromidum (NH_4Br).



Ammonii Carbonas ($\text{N}_3\text{H}_{11}\text{C}_2\text{O}_5$).Ammonii Citratis Liquor ($(\text{NH}_4)_3\text{C}_6\text{H}_5\text{O}_7$).Ammonii Chloridum (NH_4Cl).Ammonii Phosphas ($(\text{NH}_4)_2\text{HPO}_4$).Amyl Nitris ($\text{C}_5\text{H}_{11}\text{NO}_2$).Antimonii Oxidum (Sb_4O_6).

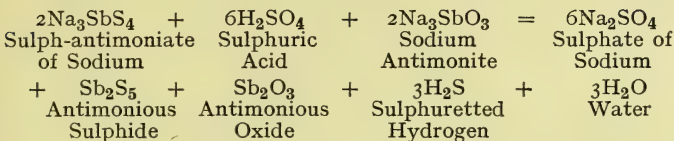
Antimonium Sulphuratum.

I.

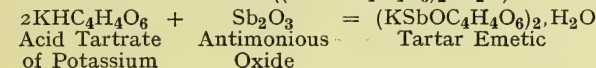


Antimonium Sulphuratum.

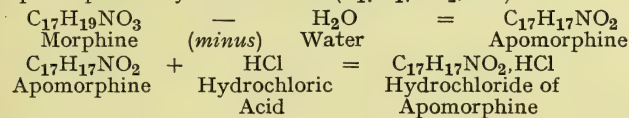
II.



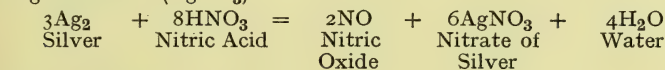
Antimonium Tartaratum ((KSbOC₄H₄O₆)₂, H₂O).



Apomorphinae Hydrochloridum (C₁₇H₁₇NO₂, HCl).



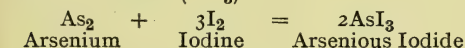
Argenti Nitras (AgNO₃).



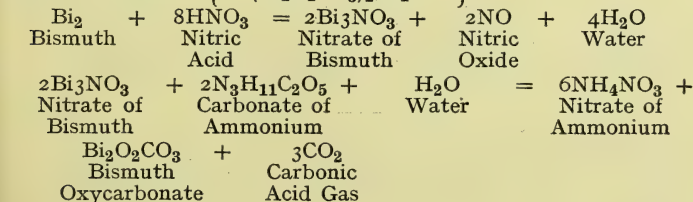
Argenti Oxidum (Ag₂O).



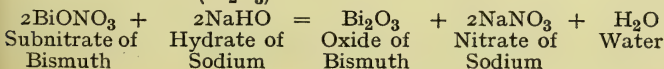
Arsenii Iodidum (AsI₃).



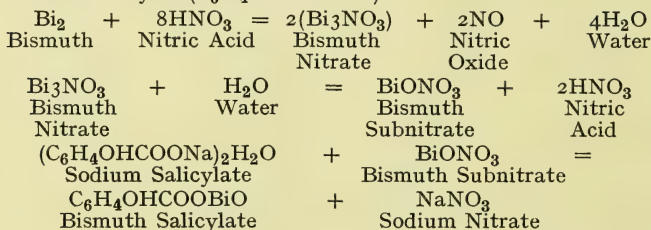
Bismuthi Carbonas { (Bi₂O₂CO₃)₂, H₂O }.



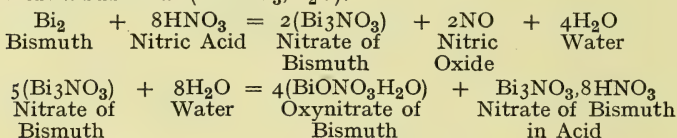
Bismuthi Oxidum (Bi₂O₃).



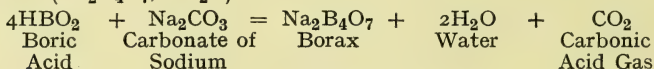
Bismuthi Salicylas ($\text{C}_6\text{H}_4\text{OHCOOBiO}$).



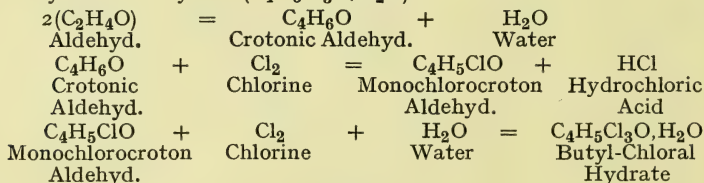
Bismuthi Subnitras ($\text{BiONO}_3, \text{H}_2\text{O}$).



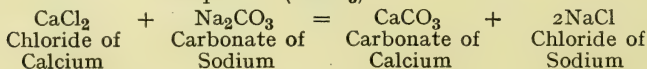
Borax ($\text{Na}_2\text{B}_4\text{O}_7, 10\text{H}_2\text{O}$).



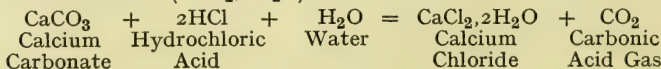
Butyl-Chloral Hydras ($\text{C}_4\text{H}_5\text{Cl}_3\text{O}, \text{H}_2\text{O}$).



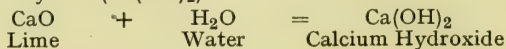
Calcii Carbonas Præcipitatus (CaCO_3).



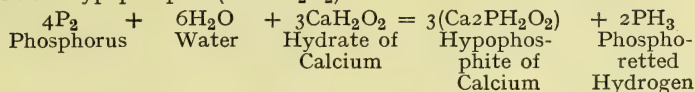
Calcii Chloridum ($\text{CaCl}_2, 2\text{H}_2\text{O}$).



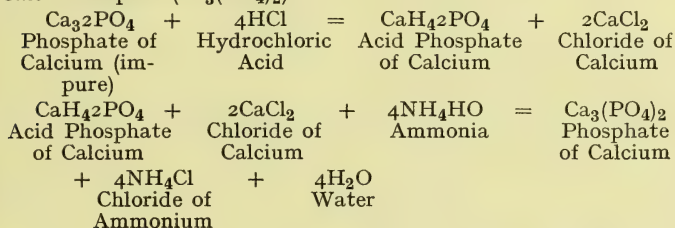
Calcii Hydras (Ca(OH)_2).



Calcii Hypophosphis ($\text{Ca}_2\text{PH}_2\text{O}_2$).



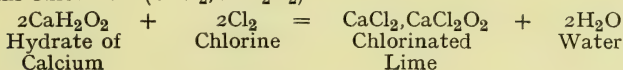
Calcii Phosphas ($\text{Ca}_3(\text{PO}_4)_2$).



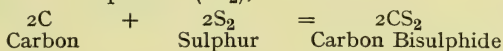
Calx (CaO).



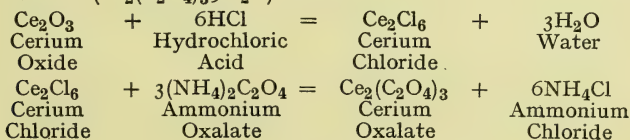
Calx Chlorinata ($\text{CaCl}_2, \text{CaCl}_2\text{O}_2$).



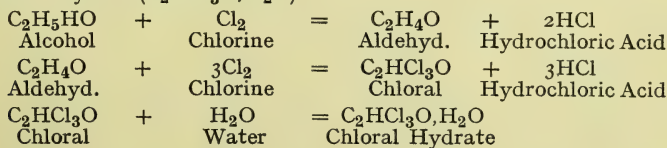
Carbonis Bisulphidum (CS_2),

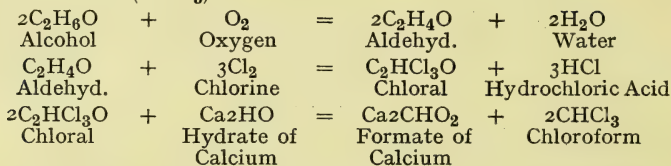


Cerii Oxalas ($\text{Ce}_2(\text{C}_2\text{O}_4)_3 \cdot 9\text{H}_2\text{O}$).

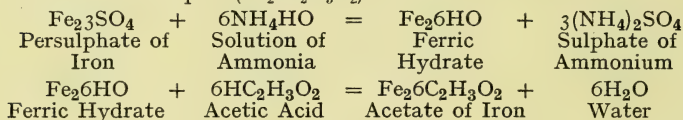
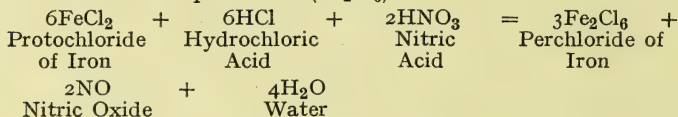
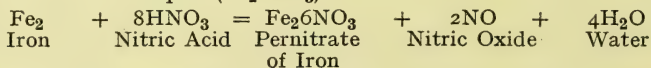
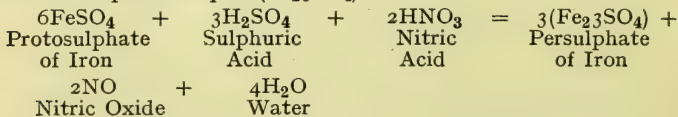
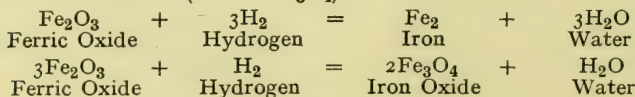


Chloral Hydras ($\text{C}_2\text{HCl}_3\text{O}, \text{H}_2\text{O}$).

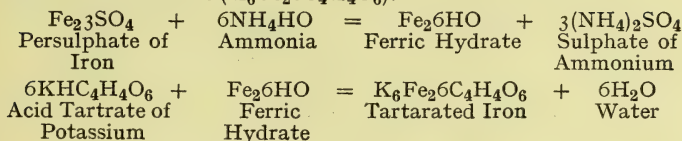


Chloroformum (CHCl_3).Cupri Sulphas ($\text{CuSO}_4, 5\text{H}_2\text{O}$).

FERRIC SALTS—

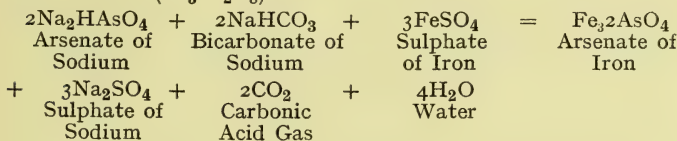
Ferri Acetatis Liquor ($\text{Fe}_26\text{C}_2\text{H}_3\text{O}_2$).Ferri Perchloridi Liquor Fortis (Fe_2Cl_6).Ferri Pernitratis Liquor (Fe_26NO_3).Ferri Persulphatis Liquor (Fe_23SO_4).Ferrum Redactum (Fe and Fe_3O_4).

Ferrum Tartaratum ($K_6Fe_26C_4H_4O_6$).

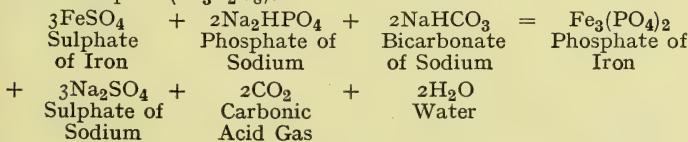


FERROUS SALTS—

Ferri Arsenas ($Fe_3As_2O_8$).

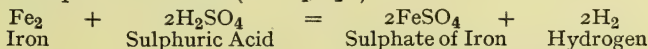


Ferri Phosphas ($Fe_3P_2O_8$).

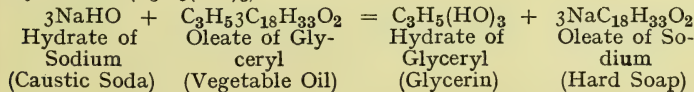


Ferri Sulphas ($FeSO_4 \cdot 7H_2O$).

Ferri Sulphas Exsiccatus ($FeSO_4 \cdot H_2O$).

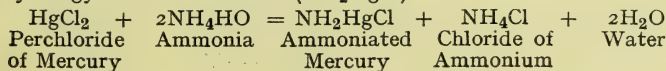


Glycerinum ($C_3H_5(HO)_3$).

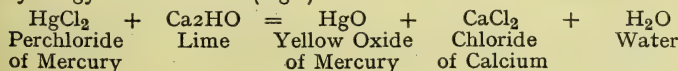


MERCURIC SALTS—

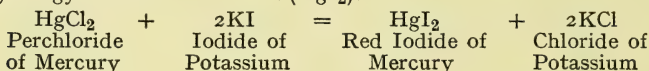
Hydrargyrum Ammoniatum (NH_2HgCl).



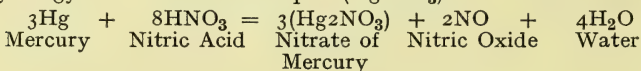
Hydrargyri Flava Lotio (HgO).



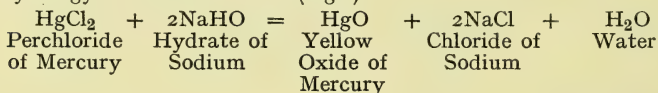
Hydrargyri Iodidum Rubrum (HgI_2).



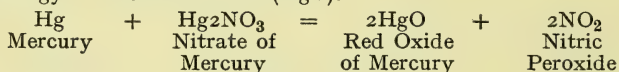
Hydrargyri Nitratis Acidus Liquor (Hg_2NO_3).



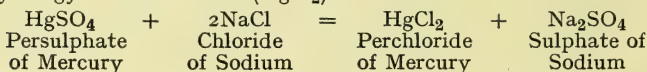
Hydrargyri Oxidum Flavum (HgO).



Hydrargyri Oxidum Rubrum (HgO).

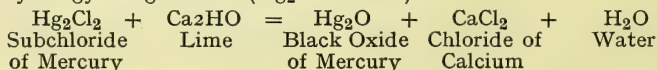


Hydrargyri Perchloridum (HgCl_2).

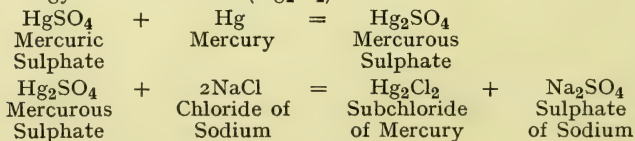


MERCUROUS SALTS—

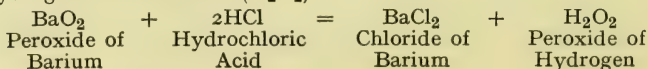
Hydrargyri Nigra Lotio (Hg_2O in water).



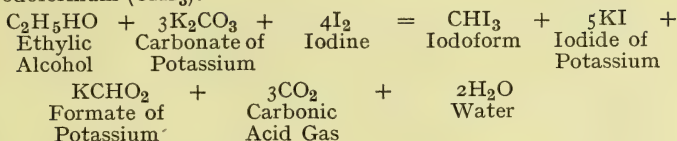
Hydrargyri Subchloridum (Hg_2Cl_2).



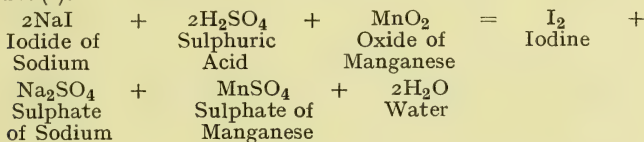
Hydrogenum Peroxidum (H_2O_2).



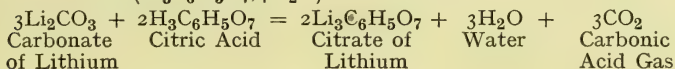
Iodoformum (CHI_3).



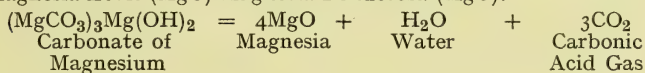
Iodum (I).



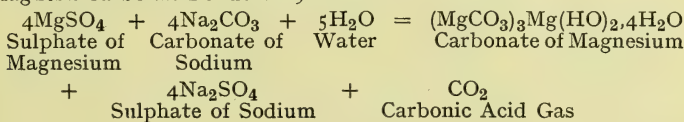
Lithii Citras ($\text{Li}_3\text{C}_6\text{H}_5\text{O}_7, 4\text{H}_2\text{O}$).



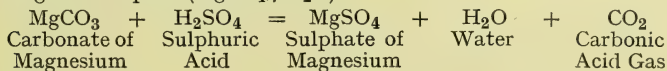
Magnesia Levis (MgO) Magnesia Ponderosa (MgO).



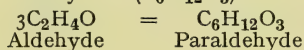
Magnesii Carbonas Levis }
Magnesii Carbonas Ponderosa } (($\text{MgCO}_3)_3\text{Mg}(\text{HO})_2, 4\text{H}_2\text{O}$).



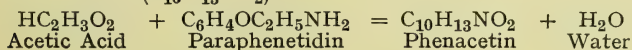
Magnesii Sulphas ($\text{MgSO}_4, 7\text{H}_2\text{O}$).



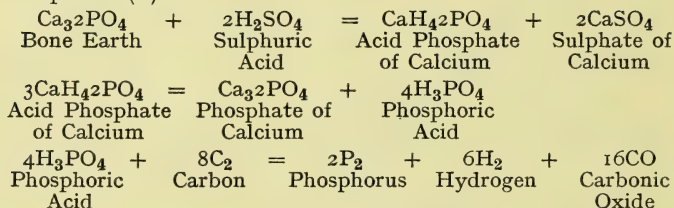
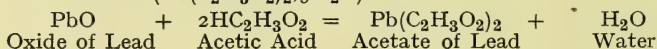
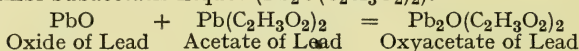
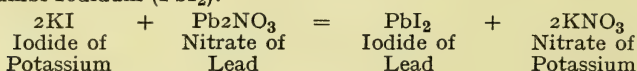
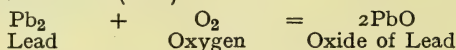
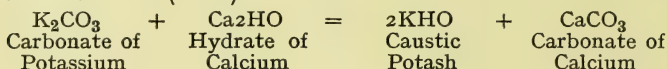
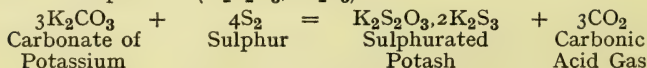
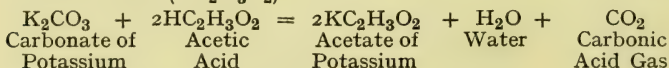
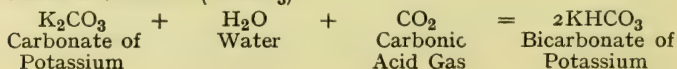
Paraldehydum ($\text{C}_6\text{H}_{12}\text{O}_3$).



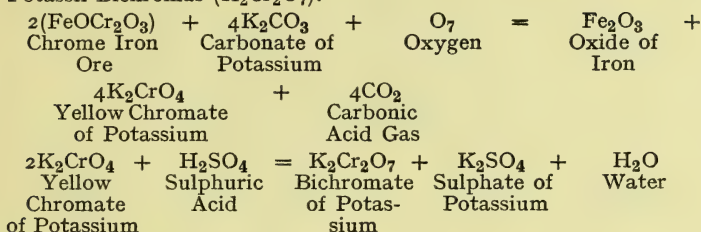
Phenacetinum ($\text{C}_{10}\text{H}_{13}\text{NO}_2$).



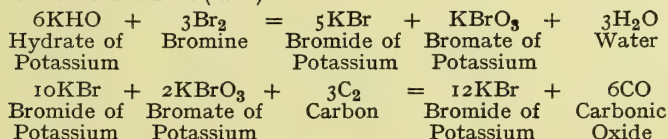
Phosphorus (P).

Plumbi Acetas ($\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2 \cdot 3\text{H}_2\text{O}$).Plumbi Subacetatis Liquor ($\text{Pb}_2\text{O}(\text{C}_2\text{H}_3\text{O}_2)_2$).Plumbi Iodidum (PbI_2).Plumbi Oxidum (PbO).Potassa Caustica (KHO).Potassa Sulphurata ($\text{K}_2\text{S}_2\text{O}_3 \cdot 2\text{K}_2\text{S}_3$).Potassii Acetas ($\text{KC}_2\text{H}_3\text{O}_2$).Potassii Bicarbonas (KHCO_3).

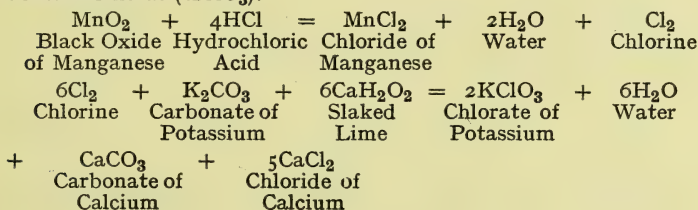
Potassii Bichromas ($K_2Cr_2O_7$).



Potassii Bromidum (KBr).



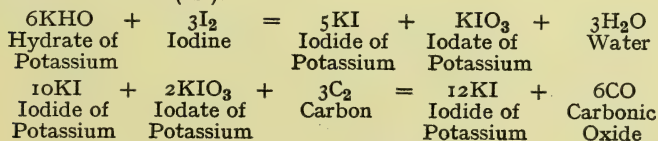
Potassii Chloras ($KClO_3$).



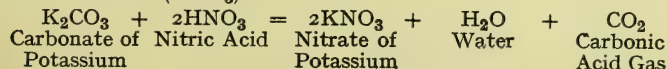
Potassii Citras ($K_3C_6H_5O_7$).



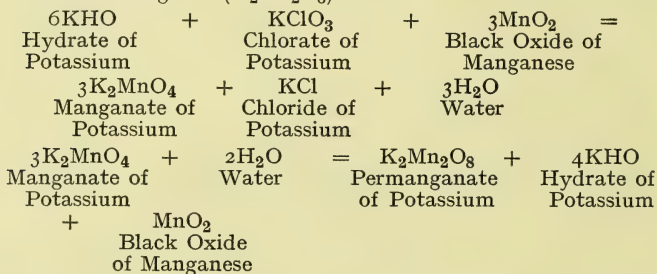
Potassii Iodidum (KI).



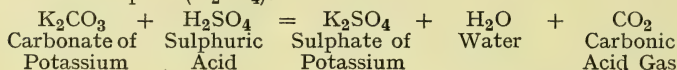
Potassii Nitras (KNO_3).



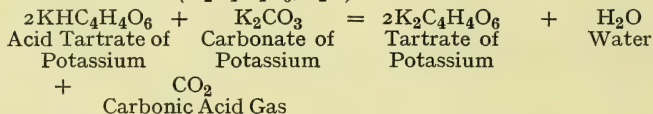
Potassii Permanganas ($K_2Mn_2O_8$).



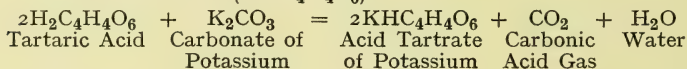
Potassii Sulphas (K_2SO_4).



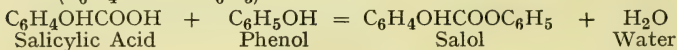
Potassii Tartras ($K_2C_4H_4O_6, H_2O$).



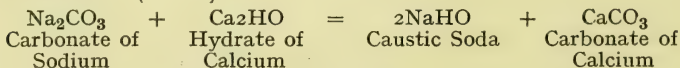
Potassii Tartras Acida ($KHC_4H_4O_6$).



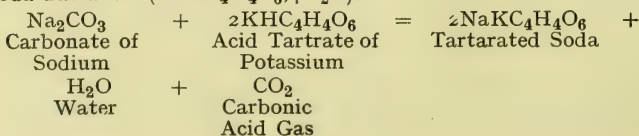
Salol ($C_6H_4OHCOOC_6H_5$).



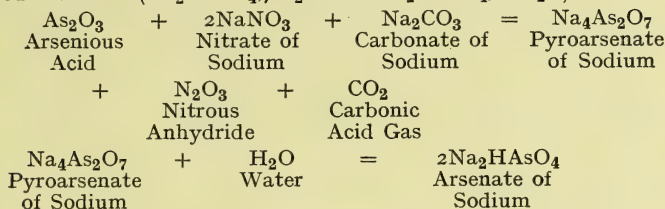
Soda Caustica ($NaHO$).



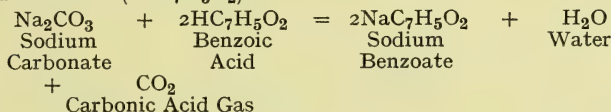
Soda Tartarata ($NaKC_4H_4O_6, 4H_2O$).



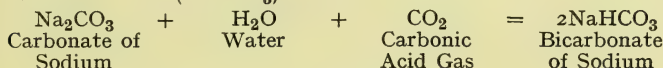
Sodii Arsenas ($\text{Na}_2\text{HAsO}_4, 7\text{H}_2\text{O}$ and $\text{Na}_2\text{HAsO}_4, 12\text{H}_2\text{O}$).



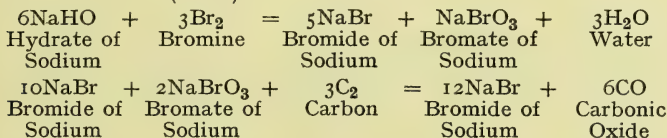
Sodii Benzoas ($\text{NaC}_7\text{H}_5\text{O}_2$).



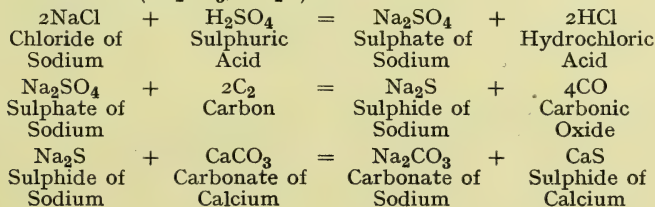
Sodii Bicarbonas (NaHCO_3).



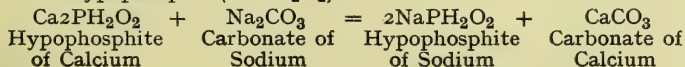
Sodii Bromidum (NaBr).



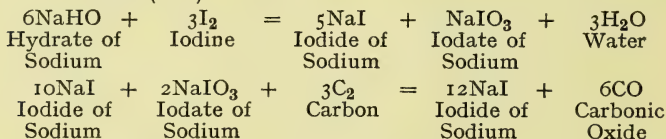
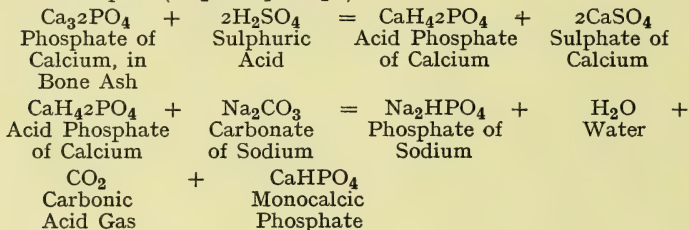
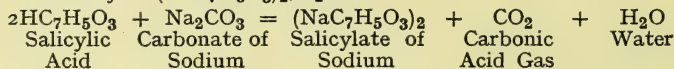
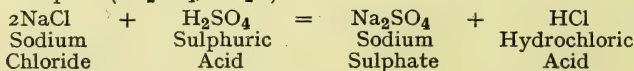
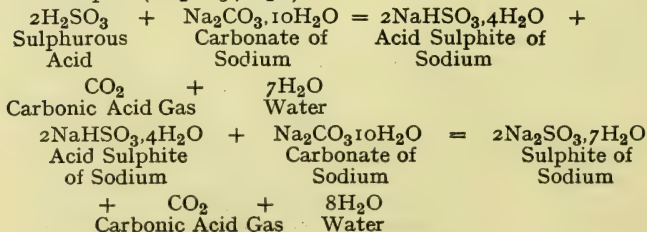
Sodii Carbonas ($\text{Na}_2\text{CO}_3, 10\text{H}_2\text{O}$).



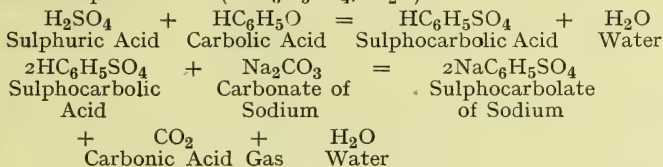
Sodii Hypophosphis (NaPH_2O_2).



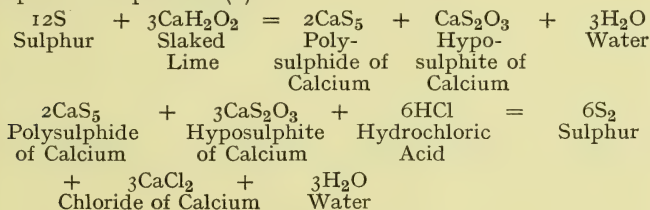
Sodii Iodidum (NaI).

Sodii Nitris (NaNO₂).Sodii Phosphas (Na₂HPO₄, 12H₂O).Sodii Salicylas (NaC₇H₅O₃)₂, H₂O.Sodii Sulphas (Na₂SO₄, 10H₂O).Sodii Sulphis' (Na₂SO₃, 7H₂O).

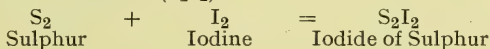
Sodii Sulphocarbolas ($\text{NaC}_6\text{H}_5\text{SO}_4, 2\text{H}_2\text{O}$).



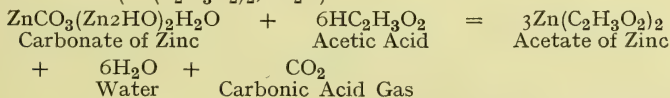
Sulphur Præcipitatum (S).



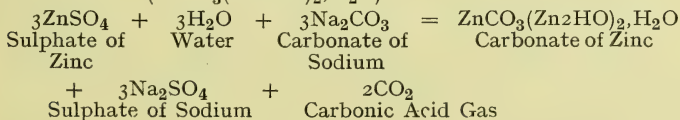
Sulphuris Iodidum (S_2I_2).



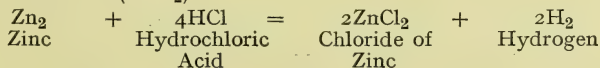
Zinci Acetas ($\text{Zn}(\text{C}_2\text{H}_3\text{O}_2)_2, 2\text{H}_2\text{O}$).



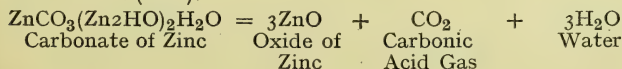
Zinci Carbonas ($\text{ZnCO}_3(\text{Zn}_2\text{HO})_2, \text{H}_2\text{O}$).



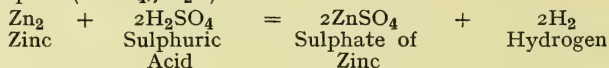
Zinci Chloridum (ZnCl_2).



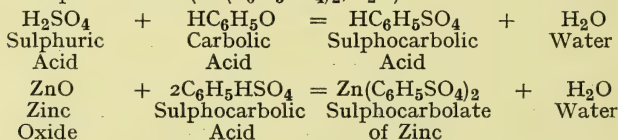
Zinci Oxidum (ZnO).



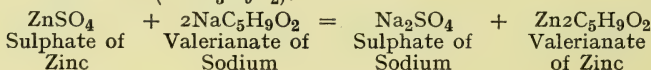
Zinci Sulphas ($\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$).



Zinci Sulphocarbolas ($\text{Zn}(\text{C}_6\text{H}_5\text{SO}_4)_2 \cdot \text{H}_2\text{O}$).



Zinci Valerianas ($\text{Zn}_2\text{C}_5\text{H}_9\text{O}_2$).



OUTLINE OF THE B.P. VEGETABLE MATERIA MEDICA.

(WITH THE NATURAL ORDERS ARRANGED ALPHABETICALLY
FOR RAPID REFERENCE).

Amyridaceæ or Burseraceæ

1. Balsamodendron Myrrha (Myrrh), and
2. Probably other species.

The gum-resin from the stem—Tincture 1 in 5 ; Pill of Aloes and Myrrh 1 in $4\frac{1}{2}$. Also enters into 1 Decoction, 1 Mixture, and 2 Pills.

Apocynaceæ. (See Loganiaceæ).

Aristolochiaceæ

1. Aristolochia Serpentina, or } (Serpentary or Snake Root).
2. Aristolochia reticulata }

The dried rhizome and rootlets—Infusion 1 in 20 ; Tincture 1 in 5 ;
Concentrated Solution 1 in 2.

Enters into Compound Tincture of Cinchona.

Asclepiadaceæ

Hemidesmus indicus (Indian Sarsaparilla).

The dried root—Syrup 1 in 8.

Aurantiaceæ

1. *Citrus Aurantium, var. Bigaradia* (Bitter Orange).

The *fresh* outer part of the pericarp—Wine ; Tincture 1 in 4 ; Syrup 1 of Tincture in 8.

The *dried* outer part of the pericarp—Infusion 1 in 20 ; Compound Infusion 1 in 40.

The fresh flowers—Orange-flower Water ; Syrup 1 in 6 $\frac{3}{4}$. The water enters into 1 Mixture and 1 Syrup.

In addition, Orange-peel or its preparations enter into 3 Tinctures, 2 Wines, 1 Infusion, 1 Spirit, 1 Mixture, 1 Confection, and 2 Syrups.

2. *Citrus Medica, var. B. Limonum* (Lemon).

The outer part of the pericarp of the fruit—Tincture 1 in 4 and Syrup.

The oil from the same—Enters into 1 Liniment, 1 Tincture, and 1 Spirit.

The freshly expressed juice of the ripe fruit—Syrup. Citric Acid.

3. *Citrus, various species.*

Used as a source of Citric Acid.

Berberidaceæ

Podophyllum peltatum (May Apple).

The dried rhizome and rootlets—Resin ; Tincture, 2 grs. Resin in 1 dr. (This is also classed under Ranunculaceæ.)

Burseraceæ. (See Amyridaceæ.)**Camelliaceæ or Ternstroemiaceæ**

Camellia Thea (Tea Plant).

The dried leaves—Caffeine, Caffeine Citrate, and Effervescent Citrate.

Cannabinaceæ

1. *Cannabis sativa* (Indian Hemp).

The dried flowering or fruiting tops of the female plants grown in India, and from which the resin has not been removed.

Extract ; and Tincture 1 in 20, which enters into Tr. Chlorof. et Morph. Co.

2. *Humulus Lupulus* (Hop).

The dried strobiles from cultivated plants.

Lupulin ; Infusion 1 in 20 ; Tincture 1 in 5.

Caprifoliaceæ

Sambucus nigra (Elder).

The fresh flowers separated from the stalks—Water, 10 lbs. to 1 gallon.

Celastraceæ

Euonymus atropurpureus (Wahoo).

The *dry* extract from the root bark.

Cinchonaceæ or Rubiaceæ

1. *Psychotria Ipecacuanha* (Ipecacuanha or Hippos).

The dried root—Lozenge $\frac{1}{4}$ gr. in each ; Lozenge of I. and Morphine $\frac{1}{12}$ gr. each ; Compound Powder 1 in 10 ; I. and Squill Pill 1 in 20 ; and Liquid Extract (= 2 to 2.25% alkaloids) from which are prepared Wine 1 in 20 and Vinegar 1 in 20.

2. Various species of *Cinchona*, and

3. Of *Remijia* may be used for obtaining the Salts of Quinine.

4. *Cinchona succirubra* (Red *Cinchona*).

The dried bark of the stem and branches of cultivated plants.

Liquid Extract (= 5% alkaloids) ; Acid Infusion 1 in 20 ; Tincture 1% alkaloids ; Compound Tincture 1 in 10.

AB In all the Galenical preparations the *red* bark only is permitted, and it may also be used as the source of Quinine Salts. Quinine enters into 2 Tinctures, 1 Wine, 1 Scale Preparation, and 1 Pill.

5. *Coffea arabica* (Coffee).

The dried seeds, used for obtaining Caffeine.

6. *Uncaria Gambier* (Catechu or Pale Catechu).

An extract of the leaves and young shoots—Tincture 1 in 5 ;
Lozenge 1 gr. in each ; Compound Powder 1 in $2\frac{1}{2}$.

Compositæ

1. *Anacyclus Pyrethrum* (Pellitory).

The dried root—Tincture 1 in 5.

2. *Anthemis nobilis* (Chamomile).

The dried expanded flower heads from cultivated plants.
Extract and Oil.

3. *Arnica montana* (Arnica).

The dried rhizome and rootlets—Tincture 1 in 20.

4. *Artemisia maritima*, *var.* *Stechmanniana* (Santonica).

The dried unexpanded flower heads or capitula, yielding Santonin.
Lozenges 1 gr. in each.

5. *Taraxacum officinale* (Dandelion).

(a) The *fresh* roots collected in autumn—Extract.

(b) The *juice* from the above.

(c) The *dried* roots collected in autumn—Liquid Extract 1 in 1.

Coniferæ1. *Juniperus communis* (Juniper).

The oil distilled from the full-grown unripe green fruit.
Spirit 1 in 20. Enters into Creosote Mixture.

2. *Juniperus oxycedrus* and some other species.

The oily liquid (**Oil of Cade**) obtained by the destructive distillation of the woody portions.

3. *Pinus palustris* (Pitch Pine).4. *Pinus sylvestris* (Scotch Fir).5. *Pinus Tæda* (Frankincense Pine).

(a) The distilled and rectified oil (**Oil of Turpentine**) from the Oleo-Resin (Turpentine) obtained from *P. sylvestris* and other species.
Liniment 13 in 20; Acetic Liniment 4 in 9.

(b) The residue (**Resin**) left after the distillation of the above.

Plaster 1 in $9\frac{1}{2}$; Ointment 1 in $3\frac{3}{4}$. Also enters into 7 Plasters.

(c) A bituminous Liquid (**Stockholm Tar**) obtained from the wood of *P. sylvestris* and other species by destructive distillation—
Ointment 5 in 7.

(d) The Concrete Turpentine (**Frankincense**) scraped off the trunks of *P. palustris* and *P. Tæda*—Enters into Pitch Plaster.

6. *Abies balsamea* (Balsam Fir).

The Turpentine (**Canada Turpentine**) obtained from above.
Enters into Flexible Collodion.

7. *Pinus Pumilio* (Pumilio Pine).

The oil distilled from the fresh leaves.

8. *Picea excelsa* (Spruce).

The resinous exudation (**Burgundy Pitch**) from the stem, melted and strained—Enters into Pitch Plaster 1 in 2.

Convolvulaceæ1. *Convolvulus Scammonia* (Scammony).

(a) The gum-resin obtained by incising the living root—Resin.

(b) The dried root, from which the resin is chiefly made, which enters into Compound Pill 1 in 3; Compound Powder 1 in 2; Compound Pill and Extract of Colocynth.

2. *Ipomœa Purga* (Jalap).

The dried tubercules—Extract; Tincture 1 in 5 = 1.5% resin; Compound Powder 1 in 3; Compound Scammony Powder 3 in 8; and Resin, which enters into Compound Scammony Pill.

Cruciferae1. *Brassica alba* (White Mustard).

The dried ripe seeds.

2. *Brassica nigra* (Black Mustard).

The dried ripe seeds.

Volatile Oil, and Compound Liniment, 1 in 27; Sinapis—the powdered seeds of white and black mustard mixed. Charta.

3. *Cochlearia Armoracia* (Horseradish).

The fresh roots from cultivated plants—Compound Spirit 1 in 8.

Cucurbitaceæ1. *Citrullus Colocynthis* (Colocynth or Bitter Apple).

The dried pulp of the fruit freed from seeds—Compound Pill 1 in 6; Pill with *Hyoscyamus* 1 in 9; Compound Extract 1 in 4½.

2. *Ecballium Elaterium* (Squirting Cucumber).

Elaterium (the sediment from the juice of the fruit), Elaterin (the active principle of Elaterium), Compound Powder 1 in 40.

Cupuliferæ or Corylaceæ*Quercûs infectoria*.

Excrescences caused by the puncture and deposit of the eggs of *Cynips Gallæ tinctoriæ*—Ointment 1 in 5; Ointment with Opium 1 in 5; Gallic and Tannic Acids and their preparations.

Ericaceæ*Arctostaphylos Uva-ursi* (Bearberry).

The dried leaves—Infusion 1 in 20.

Erythroxylaceæ*Erythroxylum Coca* and its varieties (Coca).

The dried leaves.

Liquid Extract 1 in 1; Cocaine; Ointment 1 in 25; Hydrochloride of Cocaine; Discs $\frac{1}{10}$ gr. in each; Hypodermic Injection 10 grs. in 110 mins.; Lozenge with *Krameria* $\frac{1}{20}$ gr. in each.

Euphorbiaceæ1. *Croton Eluteria* (Cascarilla).

The dried bark—Infusion 1 in 20; Tincture 1 in 5.

2. *Croton Tiglium* (Purging Croton).

The oil expressed from the seeds—Liniment 1 in 8.

3. *Hevea brasiliensis*, and probably other species (Caoutchouc).

The prepared milk-juice—Solution 1 in 20. In Charta Sinapis.

4. *Ricinus communis* (Castor Oil Plant).

The oil expressed from the seeds—Mixture 3 in 8.

Enters into 1 Collodion, 1 Liniment, and 1 Pill.

Filices

Aspidium Filix-mas (Male Fern).

The rhizome, collected late in autumn, divested of its roots, leaves, and dead matter, and carefully dried——Liquid Extract.

Fungi

Claviceps purpurea (Ergot).

The sclerotium (mycelium or spawn) originating in the ovary of *Secale cereale* (Common Rye).

Extract; Hypodermic Injection 10 in 33; Liquid Extract 1 in 1;
Infusion 1 in 20; Ammoniated Tincture 1 in 4.

Gentianaceæ

1. *Gentiana lutea* (Gentian).

The dried rhizome and roots——Extract, Infusion 1 in 80; Compound Tincture 1 in 10.

2. *Swertia Chirata* (Chiretta).

The dried plant, collected when in flower.

Infusion 1 in 20; Tincture 1 in 10; Concentrated Solution 1 in 2.

Graminaceæ

1. *Oryza sativa* (Rice).

Used as a source of starch.

2. *Secale cereale* (Common Rye).

The spawn of the fungus (*Claviceps purpurea*) originating in the ovary. (See Fungi.)

3. *Triticum sativum* (Wheat).

Used as a source of starch.

4. *Zea Mays* (Maize or Indian Corn).

Used as a source of starch.

Guttiferæ

Garcinia Hanburii (Gamboge).

The gum resin——Compound pill 1 in 6.

Hamamelidaceæ

Hamamelis virginiana (Witch Hazel).

The dried bark——Tincture 1 in 10.

The dried leaves——Liquid Extract 1 in 1; Ointment 1 in 10.

The fresh leaves——Solution 1 in 1.

Iridaceæ

Crocus sativus (Saffron).

The dried stigmas and tops of the styles——Tincture 1 in 20.
Enters into 1 Decoction and 1 Tincture.

Labiatae1. *Lavandula vera* (Lavender).

The oil distilled from the flowers—Spirit 1 in 10; Compound Tincture 45 minims to 1 pint. Enters into 1 Liquor and 1 Liniment.

2. *Mentha arvensis vars. piperascens et glabrata*.

The oil distilled from the fresh herb is used as a source of menthol.

3. *Mentha piperita* (Peppermint).

The oil distilled from the fresh flowering herb.
Water 77 mins. to 1 gallon; Spirit 1 in 10, and Menthol.
Enters into 1 Pill and 1 Tincture.

4. *Mentha viridis* (Spearmint).

The oil distilled from the fresh flowering herb.
Water 77 mins. to 1 gallon.

5. *Monarda punctata* (Horsemint).

The volatile oil—Used as a source of Thymol.

6. *Rosmarinus officinalis* (Rosemary).

The oil distilled from the flowering tops—Spirit 1 in 10.
Enters into Soap Liniment and Compound Tincture of Lavender.

7. *Thymus vulgaris* (Garden Thyme).

The volatile oil—Used as a source of Thymol.

Lauraceae1. *Cinnamomum Camphora* (Camphor).

A white crystalline substance obtained from the wood.
Water $\frac{1}{2}$ gr. in 1 oz.; Liniment 1 in 5; Ammoniated Liniment 1 in 8; Spirit 1 in 10; Compound Tincture $1\frac{1}{2}$ grs. in 1 oz.
Also enters into 1 Ointment and 9 Liniments.

2. *Cinnamomum zeylanicum* (Ceylon Cinnamon).

The dried inner bark of shoots from the truncated stocks of the cultivated tree from Ceylon—Oil; Spirit 1 in 10; Water 1 in 10; Compound Powder 1 in 3; Tincture 1 in 5.
Cinnamon or its preparations also enters into 4 Mixtures, 2 Pills, 3 Powders, 3 Tinctures, 1 Acid, 1 Decoction, and 2 Syrups.

3. *Sassafras officinale* (Sassafras).

The dried root reduced to chips or shavings.
Enters into Concentrated Compound Solution of Sarsaparilla.

Leguminosae1. *Acacia Senegal* and other species (*Acacia*).

A gummy exudation from the stems and branches.
Mucilage 4 and 6. Enters into 1 Pill, 2 Powders and all the Lozenges. Mucilage enters into Mist, Ol, Ricini,

2. *Andira Araroba* (Araroba).

A substance found in cavities in the trunk—Chrysarobin and its Ointment 1 in 25.

3. *Astragalus gummifer*, and other species (Syrian *Tragacanth*).

A gummy exudation from the stem.

Glycerin 1 in 5 ; Compound Powder 1 in 6 ; Mucilage 60 grs. in 10 ozs.

Also enters into 1 Compound Powder, 1 Confection, 1 Lotion, and 2 Mixtures.

4. *Cassia acutifolia* (Alexandrian Senna).5. *Cassia angustifolia* (East Indian or Tinnivelly Senna).

The dried leaflets.

Confection 1 in 11 ; Infusion 1 in 10 ; Syrup 1 in 2 ; Compound Tincture 1 in 5 ; Concentrated Solution 1 in 1 ; and Co. Mixture. Also enters into Compound Liquorice Powder.

6. *Cassia Fistula* (Purging Cassia).

The pulp from the pods. Enters into Confection of Senna.

7. *Copaifera Lansdorfii* (Copaiba or Copaiva).

The oleo-resin from the trunk, and the oil distilled from it.

8. *Cytisus scoparius* (Broom).

The *fresh* and *dried* tops—Infusion 1 in 10 (dried tops). The juice from the fresh tops.

9. *Glycyrrhiza glabra* (Liquorice).

The peeled root and peeled subterranean stem—Extract, Liquid Extract, Compound Powder 1 in 6. Also enters into 1 Mixture, 1 Decoction, 1 Tincture, 1 Confection, and 1 Pill.

10. *Hæmatoxylon campechianum* (Logwood).

The heart-wood—Decoction 1 in 20.

11. *Myroxylon Pereiræ* (Peru).

A balsam exuding from the trunk after the bark has been beaten and scorched.

12. *Myroxylon Toluifera* (Tolu).

A balsam exuding from the trunk—Tincture 1 in 10 ; Syrup 1 in 29. Enters into 1 Compound Tincture, 2 Lozenges, and 1 Mixture.

13. *Physostigma venenosum* (Calabar Bean).

The dried seed—Extract, Physostigmine Sulphate or Eserine Sulphate and Discs, $\frac{1}{1000}$ gr.

14. *Pterocarpus Marsupium* (Kino).

The juice from the trunk evaporated to dryness—Tincture 1 in 10 ; Compound Powder 3 in 4. Enters into Compound Catechu Powder.

15. *Pterocarpus santalinus* (Red Sanders or Sandal Wood).
The heart-wood. Enters into Compound Tincture of Lavender.

16. *Tamarindus indica* (Tamarind).
The fruit freed from the brittle outer parts and preserved with sugar.
Enters into Confection of Senna.

Lichenes

Roccella—various species—(Dyer's weed or Litmus).
Solution and Papers, introduced into B.P. Appendix for testing.

Liliaceæ

1. *Aloe vera* and *A. chinensis*, and probably other species (Barbados Aloes).

The juice which flows from the transversely cut leaves evaporated to dryness, imported from the Dutch West Indies.

Compound Decoction 4 grs. to 1 oz.; Extract; Pill 1 in 2; Pill with Iron 1 in 4½; Tincture 1 of Ext. in 40; Gamboge Pill 1 in 6; Colocynth Pill 1 in 3; do with *Hyoscyamus* 1 in 4½; Compound Extract of Colocynth 1 in 2¼. Aloin.

2. *Aloe Perryi*, and probably other species (Socotrine Aloes).

The juice from the transversely cut leaves evaporated to dryness, imported by way of Bombay and Zanzibar.

Pill 1 in 2; Rhubarb Pill 1 in 6; Pill with *Asafetida* 1 in 4; Pill with Myrrh 1 in 2¼; Friar's Balsam 1 in 60. Aloin.

3. *Urginea Scilla* (Squill).

The bulb divested of its outer scales, sliced and dried.

Acetum 1 in 8; Oxy-mel; Syrup 1 in 17; Tincture 1 in 5; Compound Pill 1 in 4; Pill with *Ipecac.*, 3½ in 20.

Linaceæ

Linum usitatissimum (Flax).

The dried ripe seeds—Oil.

The dried ripe seeds crushed.

Erythroxylon Coca is sometimes classed under this order. (See *Erythroxylaceæ*.)

Liquidambaraceæ or Altingiaceæ

Liquidambar orientalis (Storax Tree).

A balsam obtained from the trunk—Enters into Friar's Balsam.

Storax has been placed also under the *Styracaceæ*, *Balsamifloræ*, and *Hamamelidaceæ*, which latter order is often made to include the *Liquidambaraceæ*.

Lobeliaceæ

Lobelia inflata (Lobelia).

The dried flowering herb—Ethereal Tincture 1 in 5.

Loganiaceæ or Apocynaceæ

1. *Gelsemium nitidum* (Yellow Jasmine).

The dried rhizome and roots——Tincture 1 in 10.

2. *Strophanthus Kombé* (The Kombé).

The dried ripe seeds freed from the awns——Tincture 1 in 40;
Extract 1 in 2.

3. *Strychnos Nux-vomica* (Nux Vomica).

The dried ripe seeds——Extract 5% Strychnine; Liquid Extract
1½ grs. Strychnine in 110 mins.; Tincture 2 of liq. ext. in 12 =
¼ gr. Strychnine in 110 mins.

Strychnine; Strychnine Hydrochloride and Solution of Strychnine
1 gr. in 110 mins.

Magnoliaceæ

- Illicium verum* (Star-Anise).

The oil distilled from the fruit——Spirit 1 in 10.

Malvaceæ

- Gossypium barbadense* and other species (Cotton).

The hairs of the seed freed from fatty matter——Cotton.

Enters into Pyroxylin, which enters into 3 Collodions.

Melanthaceæ

1. *Colchicum autumnale* (Meadow Saffron).

(a) The fresh corm collected in early summer.

Extract.

(b) The corm stripped of its coats, sliced and dried under 150°.

Wine 1 in 5.

(c) The dried ripe seeds.

Tincture 1 in 5.

2. *Schoenocaulon officinale* (Cevadilla).

The dried ripe seeds——Used for obtaining Veratrine. Ointment
1 in 50.

Menispermaceæ

1. *Anamirta paniculata*.

Picrotoxin——A neutral principle from the seeds.

2. *Chondrodendron tomentosum* (Pareira).

The dried root——Liquid Extract.

3. *Jateorhiza Columba* (Calumba).

The dried root, sliced——Infusion 1 in 20; Tincture 1 in 10; and
Concentrated Solution 1 in 2.

Moraceæ (Sometimes regarded as a sub-order of Urticaceæ).

- Ficus Carica* (Figs).

The dried fleshy receptacles——Enters into Confection of Senna.

Myristicaceæ

Myristica fragrans (Nutmeg).

The dried seed divested of its testa.

Oil, and Spirit 1 in 10.

Enters into 2 Powders, 2 Spirits, 1 Pill, 2 Tinctures, and 1 Mixture.

Myrtaceæ

1. *Eucalyptus Globulus* (*Eucalyptus* or Blue Gum) and other species.

The oil distilled from the fresh leaves——Ointment 1 in 10.

2. *Eucalyptus rostrata* (Red Gum) and other species.

The ruby exudation from the bark. Lozenges 1 grain each.

3. *Eugenia caryophyllata* (Cloves).

The dried flower-bud——Oil, Infusion 1 in 40. Also enters into 1 Infusion, 1 Powder, and 2 Pills.

4. *Melaleuca Leucadendron* or *Melaleuca Cajuputi* (Cajuput).

The oil distilled from the leaves.

Spirit 1 in 10. Enters into Croton Liniment.

5. *Pimenta officinalis* (Pimento).

The dried unripe full-grown fruit——Water 8 ozs. to 1 gallon, and Oil.

6. *Punica Granatum* (Pomegranate).

The dried bark of the stem and root——Decoction 4 ozs. to 1 pint.

Oleaceæ

Olea Europæa (Olive).

The oil expressed from the ripe fruit.

Enters into 2 Soaps, 3 Liniments, 4 Ointments, and 4 Plasters.

Papaveraceæ

1. *Papaver somniferum* (White Poppy). The source of Opium.

The nearly ripe dried fruits.

2. *Papaver Rhœas* (Red Poppy).

The fresh petals. Syrup 1 in 3½.

Piperaceæ

1. *Piper Cubeba* (Cubebs).

The dried unripe full-grown fruit——Oil, and Tincture 1 in 5.

2. *Piper Nigrum* (Black Pepper).

The dried unripe fruit——Confection 1 in 10.

Enters into Compound Powder of Opium.

Polygalaceæ

1. *Krameria argentea* (Para Rhatany).

2. *Krameria triandra* (Peruvian Rhatany).

The dried root—Extract; Infusion 1 in 20; Tincture 1 in 5; Lozenges, and Lozenges with Cocaine 1 gr. each; and Concentrated Solution 1 in 2.

Enters into Compound Catechu Powder.

3. *Polygala Senega* (Senega Snake Root).

The dried root—Infusion 1 in 20; Tincture 1 in 5; and Concentrated Solution 1 in 2.

Polygonaceæ

- | | |
|------------------------------|--------------|
| 1. <i>Rheum officinale</i> . | } (Rhubarb.) |
| 2. <i>Rheum palmatum</i> . | |
| 3. Probably other species. | |

The rhizome or so-called root, more or less deprived of its cortex, and dried in China and Thibet.

Extract; Infusion 1 in 20; Concentrated Solution 1 in 2; Syrup 1 in 15; Compound Tincture 1 in 10; Compound Pill 1 in 4; and Compound Powder 1 in 4½.

Ranunculaceæ1. *Aconitum Napellus* (Monkshood).

The dried root—Liniment 1 in 1½; Tincture 1 in 20; and Aconitine and its ointment 1 in 50.

2. *Cimicifuga racemosa* or *Actæa racemosa* (Black Snake Root).

Dried rhizome and roots—Liquid Extract 1 in 1; and Tincture 1 in 10.

3. *Delphinium Staphisagria* (Stavesacre).

The dried ripe seeds—Ointment 1 in 5.

4. *Hydrastis canadensis* (Golden Seal).

The dried rhizome and rootlets—Liquid Extract 1 in 1; Tincture 1 in 10.

5. *Podophyllum peltatum* (May Apple).

The dried rhizome and rootlets—Resin. Tincture, 2 grs. resin in 1 dr.

Rhamnaceæ

Rhamnus purshianus (Cascara Sagrada).

The dried bark—Extract, and Liquid Extract 1 in 1; and enters into Aromatic Syrup of Cascara 2 in 5.

Rosaceæ1. *Brayera anthelmintica* (Kousso).

The dried panicles.

2. *Prunus Amygdalus var. amara* (Bitter Almond).

The ripe seed—Yields by expression the Oil.

3. *Prunus Amygdalus var. dulcis* (Sweet or Jordan Almond).
The ripe seed—Yields by expression the Oil, which enters into
Spermaceti Ointment, Phosphorated Oil, and Liniment of
Ammonia.

Mixture 1 in 8 ; Compound Powder 8 in 13.

4. *Prunus domestica var. Juliana* (Prune).
The dried drupe. In Confection of Senna.

5. *Prunus Laurocerasus* (Cherry-Laurel).
The fresh leaves—The water 1 per cent. of HCN.

6. *Prunus serotina* (Virginian Prune).
The bark collected in autumn—Tincture 1 in 5 ; Syrup 3 in 20.

7. *Quillaja saponaria* (Quillaia or Panama Bark).
The inner bark—Tincture 1 in 20. Used in making Solution of
Coal Tar.

8. *Rosa damascena* (Damask Rose).
The fresh flowers—Water ; Distilled Oil ; Ointment of Rose
Water ; and Rose basis for 3 Lozenges. Enters into Mist.
Ferri Comp.

9. *Rosa gallica* (Red Rose).
The fresh and dried unexpanded petals from cultivated plants.
Acid Infusion 1 in 40 ; Confection 1 in 4 ; Syrup 1 in 17.
The Confection enters into 3 Pills.

Rubiaceæ. (See Cinchonaceæ.)

Rutaceæ

1. *Barosma betulina* (Buchu).
The dried leaves—Infusion 1 in 20 ; Tincture 1 in 5.

2. *Cusparia febrifuga* (Cusparia or Angostura).
The dried bark—Infusion 1 in 30 ; Concentrated Solution 1 in 2.

3. *Pilocarpus Jaborandi* (Jaborandi).
The dried leaflets—Liquid Extract 1 in 1 ; Tincture 1 in 5 ;
Nitrate of Pilocarpine.

Salicaceæ

Various species of *Salix* and *Populus*.
The bark is employed to make Salicin.

Santalaceæ

Santalum album (Sandal Wood).
The oil distilled from the wood.

Scrophulariaceæ

Digitalis purpurea (Foxglove).
The dried leaves of plants commencing to flower.
Infusion 3 grs. to 1 oz. ; Tincture 1 in 8.

Simarubaceæ

Picræna excelsa (Quassia).

The wood of the trunk and branches.

Tincture 1 in 10; Infusion 88 grs. to 1 pint; and Concentrated Solution 1 in 10.

Smilacææ

Smilax ornata (Sarsaparilla).

The dried roots imported from Costa Rica.

Liquid Extract 1 in 1; Concentrated Compound Solution 1 in 1.

Solanaceæ

1. *Capsicum minimum* (Capsicum).

The dried ripe fruit—Tincture 1 in 20; Ointment 1 in 4½. Enters into Compound Tincture of Chloroform and Morphia.

2. *Atropa Belladonna* (Belladonna).

(a) The *fresh* leaves and branches gathered when the plant is in flower. Extract (*green*).

(b) The *juice* from the above.

(c) The dried root collected in autumn—Liquid Extract $\frac{3}{4}$ gr. alkaloids in 110 mins. From this are prepared Alcoholic Extract 1 per cent. alkaloids; Suppository $\frac{1}{10}$ gr. alkaloids; Plaster 2 in 3 (.5 per cent. alkaloids); Liniment 1 in 2; Ointment .6 per cent. alkaloids; and Tincture 1 in 15 (.048 to .052 per cent. alkaloids).

From leaves or root:—Atropine and Atropine Sulphate; Liquor 1 gr. in 110 mins.; Ointment 2 per cent.; and Discs $\frac{1}{8000}$ gr.

3. *Datura Stramonium* (Stramonium).

The dried ripe seeds—Extract.

The dried leaves—Tincture 1 in 5.

4. *Hyoscyamus niger* (Henbane).

(a) The *fresh* leaves and flowers and branches collected from flowering biennial plants—Green Extract, which enters into 1 Pill.

(b) The *juice* extracted from the above.

(c) The *dried* leaves and flowering tops separated from branches—Tincture 1 in 10; Hyoscyne Hydrobromide and Hyoscyamine Sulphate.

5. Various species of *Scopola*.

Used for obtaining Hyoscyne Hydrobromide.

6. Possibly other Solanaceous Plants.

Used for obtaining Hyoscyamine Sulphate and Hyoscyne Hydrobromide.

Sterculiaceæ

Theobroma Cacao (Chocolate Tree).

The concrete oil, expressed from the seeds. Enters into 6 Suppositories.

Styracaceæ or Styraceæ

1. *Styrax Benzoin* (Siam and Sumatra Benzoin), and
2. Probably other species of *Styrax*.

The balsamic resin.

Compound Tincture 1 in 10; Benzoic Acid and its preparations;
Benzoated Lard 1 in 33 $\frac{1}{3}$. Enters into *Spermaceti* and various
other ointments.

Ternstroemiaceæ. (See *Camelliaceæ*.)**Thymelaceæ**

1. *Daphne Mezereum* (*Mezereon*).
2. *Daphne Laureola* (*Spurge Laurel*).
3. *Daphne Gnidium*.

The dried bark. Enters into Concentrated Compound Solution of
Sarsaparilla.

Umbelliferæ

1. *Carum copticum*.

The volatile oil is used as a source of *Thymol*.

2. *Carum Carvi* (*Caraway*).

The dried fruit—Water 1 lb. to 1 gallon, and Oil. Enters into 1
Confection, 2 Tinctures, 1 Powder, and 1 Pill.

3. *Conium maculatum* (*Hemlock*).

(a) The fresh leaves and young branches of wild British plants,
collected when the fruit begins to form.

The juice—Ointment 2 in 1.

(b) The dried fully developed unripe fruit—Tincture 1 in 5.

4. *Coriandrum sativum* (*Coriander*).

The dried ripe fruit—Oil. Enters into the Syrup, Confection, and
Compound Tincture of *Senna*, and into the Syrup and Tincture
of *Rhubarb*.

5. *Dorema Ammoniacum* (*Ammoniacum*), and

6. Probably other species.

The gum resin exuding from the flowering and fruiting stem.
Mixture $\frac{1}{4}$ oz. to 8 ozs.; Plaster of A. and Mercury 12 in 15.
Enters into 2 Pills.

7. *Ferula foetida* (*Asafetida*), and

8. Probably other species.

A gum-resin from incisions in the root.

Tincture 1 in 5; Pill of *Aloes* and A. 1 in 4; Fetid Spirit 33 grs.
to 1 oz.

Enters into *Pil. Galbani Co.*

9. *Ferula Sumbul* (Sumbul).

The dried transverse slices of the root—Tincture 1 in 10.

10. *Ferula galbaniflua* (Galbanum), and

11. Probably other species.

Gum-resin—Compound Pill 1 in $3\frac{1}{2}$.

12. *Fœniculum capillaceum* (Fennel).

The dried ripe fruit of cultivated plants.

Water 1 lb. to 1 gallon. Enters into Compound Liquorice Powder.

13. *Peucedanum graveolens* (Dill).

The dried fruit—Water 1 lb. to 1 gallon, and Oil.

14. *Pimpinella Anisum* (Anise).

The dried fruit.

Oil ; Water 1 lb. to 1 gallon ; Spirit 1 in 10. Enters into 2 Tinctures.

Star-Anise (*Illicium verum*) belongs to the Magnoliaceæ.

Valerianaceæ

Valeriana officinalis (Valerian).

The dried rhizome and roots, collected in autumn.

Ammoniated Tincture 1 in 5.

Vitaceæ

Vitis vinifera (Grape Vine).

The dried ripe fruit (Raisins) from Spain. Enters into 2 Tinctures.

Zingiberaceæ or Scitaminaceæ

1. *Curcuma longa* (Turmeric).

The dried rhizome—The Paper and Tincture 1 to 6 are contained in the B.P. Appendix, and are used for Testing.

2. *Elettaria Cardamomum* (Malabar Cardamom).

The dried ripe seeds—Compound Tincture 1 in 80.

Enters into 1 Compound Extract, 2 Powders, and 2 Tinctures.

The Tincture enters into 1 Decoction and 1 Mixture.

3. *Zingiber officinale* (Ginger).

The scraped and dried rhizome.

Syrup 1 in 40 ; Tincture 1 in 10. Ginger or its Compounds also enters into 14 official preparations.

Zygophyllaceæ

1. *Guaiacum officinale*, or } (*Lignum Vitæ*).
2. *Guaiacum sanctum* }

The heart-wood.

Enters into Concentrated Compound Solution of Sarsaparilla.

The resin obtained from the stem of 1 or 2. Mixture 11 grs. to

1 oz. Ammoniated Tincture 1 in 5 ; Lozenge 3 grs in each.

Enters into Compound Calomel Pill.

MATERIA MEDICA

OF THE

BRITISH PHARMACOPŒIA.

PHARMACOPŒIAL PREPARATIONS.

THE British Pharmacopœia contains many groups of preparations ; these are known as the official Galenicals. The term is derived from one of the early fathers in our art (Galen, A.D. 130-200), and it is employed in contradistinction to the extemporaneous or Magistral preparations (physicians' prescriptions), whose formulæ are written extemporarily by a magister or master of his profession. These groups of the B.P. preparations should be studied after the student has grasped the details of the official remedies which immediately follow them in the present volume, but they may be glanced at with advantage from time to time during the period of study of those details when a member of the group turns up under the heading of an official drug.

The Aceta or Vinegars of the Pharmacopœia are three in number :—

Acetum Cantharidis—2 ozs. cantharides, 10 ozs. glacial acetic acid, and 10 ozs. water.

Acetum Ipecacuanhæ—1 oz. liq. extract of ipecacuanha, 2 ozs. alcohol (90 per cent.), and diluted acetic acid to 1 pint

Acetum Scillæ—2½ ozs. squill to 1 pint diluted acetic acid.

Aquæ (The Waters—15 in number), viz.:—

Aqua Anethi—One gal. distilled from 1 lb. fruit and 2 gals. water.

Aqua Anisi—One gal. distilled from 1 lb. fruit and 2 gals. water.

Aqua Aurantii Floris—The water distilled from the flowers of the bitter orange—Citrus Aurantium—as found in commerce.

Aqua Camphoræ—A solution of camphor in water by aid of alcohol (90 per cent.), nearly ½ gr. to 1 oz.

Aqua Carui—One gal. distilled from 1 lb. of fruit and 2 gals. of water.

Aqua Chloroformi—A solution of ½ dr. chloroform in 25 ozs. water.

- Aqua Cinnamomi**—One gal. distilled from 1 lb. of bark and 2 gals. water.
- Aqua Destillata**—Perfectly pure H_2O distilled from potable water.
- Aqua Fœniculi**—One gal. distilled from 1 lb. fruit and 2 gals. water.
- Aqua Laurocerasi**—One pt. distilled from 1 lb. fresh leaves and $2\frac{1}{2}$ pts. water, and made to contain .1 per cent. real Hydrocyanic Acid.
- Aqua Menthæ Piperitæ**—One gal. distilled from 77 mins. oil and $1\frac{1}{2}$ gals. water.
- Aqua Menthæ Viridis**—One gal. distilled from 77 mins. oil and $1\frac{1}{2}$ gals. water.
- Aqua Pimentæ**—One gal. distilled from 8 ozs. pimento and 2 gals. water.
- Aqua Rosæ**—Distilled water of the flowers of Rosa Damascena, as found in commerce.
- Aqua Sambuci**—One gal. distilled from 10 lbs. fresh flowers (or an equivalent amount of the preserved flowers) and 5 gals. water.

It should be remembered that all the waters are distilled except two—Aqua Camphoræ and Aqua Chloroformi—and that their doses all range from $\frac{1}{2}$ to 1 or 2 ozs., except Aqua Laurocerasi, which contains Hydrocyanic Acid (.1 per cent. HCN), and whose dose is only $\frac{1}{2}$ to 2 drachms.

Aqua Aurantii Floris and Aqua Rosæ of commerce are saturated solutions of oil in water, and for dispensing are to be diluted, immediately before use, with twice their volume of distilled water.

Charta (Paper—1 in number).

Charta Sinapis—The fixed oil is extracted with Benzol by percolation from bruised black and white mustard. The residue is dried and powdered, and 75 grs. mixed with 5 fl. drs. of solution of India-rubber and spread on cartridge paper and dried. The paper should be dipped in tepid water before use.

Collodia (Collodions—3 in number).

Collodium—Pyroxylin 1 oz., Ether 36 ozs., Alcohol (90 per cent.) 12 ozs.

Collodium Flexile—Collodion 12 ozs., Canada Turpentine $\frac{1}{2}$ oz., Castor Oil $\frac{1}{4}$ oz.

Collodion Vesicans—Blistering Liquid 20 ozs., Pyroxylin $\frac{1}{2}$ oz.

Confections (4 in number). The last two are Cathartic, the first two faintly Astringent. Confections are soft preparations of a pasty consistence, containing a medicine blended with some form of sugar, either to preserve it, or to make its administration more agreeable. Under this heading were included the old Conserves and Electuaries.

CONFECTIONS.

CONFECTIO.	COMPOSITION.	STRENGTH.	DOSE.
Piperis ..	Powdered black pepper 2, powdered caraway fruit 3, clarified honey 15; mix.	1 in 10.	60 to 120 grs.
Rosæ Gallicæ	Fresh red rose petals 1, beaten with sugar 3.	1 in 4.	—
Sennæ ..	Powdered senna 7 oz., powdered coriander 3 oz., figs 12 oz., tamarind and cassia pulp 9 oz. each, prunes 6 oz., extract of liquorice 1 oz., sugar 30 oz., water q.s. to 75 oz. Boil the figs and prunes in 24 oz. water for 4 hours; in this digest the cassia and tamarind for 2 hours; sift, add the sugar and liquorice, dissolve, add the senna and coriander, and make up to 75 ozs.	1 in 11.	60 to 120 grs.
Sulphuris ..	Sulphur 4 oz., acid potassium tartrate 1 oz., tragacanth 18 grs., syrup 2 oz., tincture of orange $\frac{1}{2}$ oz., glycerin 1 $\frac{1}{2}$ oz.	1 in 2 $\frac{1}{2}$.	60 to 120 grs.

Decocta (Decoctions—3 in number) are watery vegetable solutions prepared by boiling. Aloe only is made in a covered vessel. All are made with distilled water and are strained, and made to measure a definite bulk towards the conclusion of the process. Dose of each is $\frac{1}{2}$ to 2 ozs.

DECOCTIONS.

DECOCTUM.	COMPOSITION.	STRENGTH.
Aloes Co. ..	Extract of Barbados aloes $\frac{1}{2}$ oz., myrrh, saffron, and potassium carbonate, of each $\frac{1}{4}$ oz., extract of liquorice 2 oz., compound tincture of cardamoms 15 oz., water q.s. to measure 50 oz. Boil all for 5 minutes, except the saffron and tincture, in 1 pint of water; add the saffron, and when cooled add the tincture 2 hours before straining, and make up to 50 oz. with water.	1 in 100.
Granati Corticis	Pomegranate bark 4 oz., boiled in 24 oz. water for 10 minutes. Product to measure 1 pint.	1 in 5.
Hæmatoxyli ..	Logwood chips 1 oz., cinnamon bark 70 grs., water 24 oz., boil for 10 minutes and strain. Product to measure 1 pint.	1 in 20.

Emplastra (Plasters—12 in number) are solid, adhesive applications for external use, either for support or intended to act as a local means of applying various active remedies. As the various ingredients are only added to the active medicine for the sake of such physical qualities as adhesiveness, softness, hardness, and the like, it is not necessary for the student to learn *their* proportions, and as the directions are complicated, and seldom required by the student of Pharmacy, who never makes them, he is referred to the name of the drug in the Materia Medica, where he will find the plasters amongst the other preparations of each remedy. All contain lead in some form except Ammon. *cum* Hyd., Menthol and Picis.

PLASTERS.

EMPLASTRUM.	ARTICLES EMPLOYED IN THE PREPARATION.	STRENGTH.
Ammoniaci <i>cum</i> Hydrargyro Belladonnæ ..	Ammoniacum, mercury, olive oil, and sublimed sulphur.	1 of Hg in 5.
Calefaciens ..	Liquid extract of belladonna, evaporated to $\frac{1}{4}$ bulk, resin plaster.	2 in 3 = '5 p.c. alkaloids.
Cantharidis ..	Cantharides, yellow beeswax, resin, resin plaster, soap plaster, and boiling water.	1 in 24 of Cantharides.
Cantharidis ..	Cantharides, yellow beeswax, lard, resin, and soap plaster.	1 in 3 (nearly).
Hydrargyri ..	Mercury, olive oil, sulphur, and lead plaster.	1 in 3.
Menthol ..	Menthol, yellow beeswax, and resin.	3 in 20.
Opii ..	Powdered opium and resin plaster.	1 in 10.
Picis ..	Burgundy pitch, frankincense, resin, yellow beeswax, olive oil, and water.	1 in 2.
Plumbi .. (Diachylon)	Lead oxide, olive oil, and water. No strength need be given, as it is chiefly <i>oleate of lead</i> , with a little glycerin.	
Plumbi Iodidi	Lead iodide, lead plaster, and resin.	1 in 10.
Resinæ .. (Adhesive Plaster.)	Resin, lead plaster, and hard soap.	1 in 9 $\frac{1}{2}$.
Saponis ..	Hard soap, lead plaster, and resin.	1 in 7.

Extracta (Extracts—39 in number) are mostly semi-solid products, obtained by the evaporation of vegetable solutions.

There are four classes of extracts, if we divide them according to the methods directed for their preparation—

1. The Fresh or Green Extracts, as hyoscyamus, etc.
2. The Aqueous or Watery, as aloes and opium.
3. The Alcoholic, as physostigma and rhubarb.
4. The Liquid, as coca and male fern.

The student should remember that these names have no connection with the *physical qualities* of the extract, except in the

case of the liquid ones. Thus, the Fresh or Green extracts are either dark brown or black in colour ; the term " green " being used to indicate that they are prepared from the green herb or fresh root : the Watery extracts may be of pilular consistence like opium, or hard and brittle like aloes.

The extracts may be, however, better divided, according to their consistence, into three well-marked groups—

1. The *Semi-solid* or pilular extracts, of which there are 16.
2. The *Hard*, Dry, or Brittle, of which there are 6.
3. The *Fluid*, of which there are 17.

The Fluid extracts will be found in the table on page 151. The table on page 152 contains both the Solid and Semi-solid ; but the student should remember that the Solid extracts are—Extracta Aloes Barbadosis, Krameriae, Cascarae Sagradae, Rhei, Strophanthi, and Euonymi Siccum (the last two being in the form of powder).

The Fresh or Green Extracts, of which there are four—viz. : Belladonna Viride, Hyoscyamus Viride, Colchicum, and Taraxacum—are prepared by expressing the juice of the drug, heating to 130° F., to coagulate the green colouring matter. This is separated and laid aside. The fluid is heated to 200° F. to coagulate all the albumin, which is useless, and which if retained would promote the decomposition of the preparation ; it is consequently rejected. The fluid resulting is evaporated by the heat of a water-bath to a syrupy state. The green colouring matter, previously separated and passed through a hair-sieve, is now added, and the evaporation continued below 140° till the consistence of a soft extract is reached. In the case of Colchicum and Dandelion, which contain no green colouring matter, the juice is at first heated to the boiling point, and maintained at this temperature for ten minutes, to coagulate the albumin, filtered and evaporated at a temperature under 160°.

The Watery Extracts (7 in number) are prepared by boiling, macerating, or infusing the substance in hot or cold distilled water, and evaporating the resulting decoction, infusion, or solution to a suitable consistence. Thus Aloes Barb. is made by exhausting with *boiling* water. Chamomile is made by first boiling, hence it is an evaporated *decoction*, to which a little essential oil is added. Liquorice and Opium are aqueous extracts prepared by maceration of the drug in *cold* water ; but the Liquorice infusions, after being strained, are boiled, and again strained before evaporation. Cascara Sagrada and Krameria are exhausted by percolation, and Gentian is first infused in *cold* water, and afterwards boiled in the infusion before the liquid is evaporated.

Liquid Extracts (17 in number) are either Alcoholic extracts dissolved in spirit and water, or *concentrated* infusions of drugs, to which enough spirit is added for their preservation. The liquid extract of opium is made from its own semi-solid extract. It is worth mention that whilst the semi-solid extract of dandelion is made from the juice of the *fresh* root, the liquid extract is prepared from the *dried* root.

EXTRACTUM.	MATERIALS USED.	STRENGTH.	DOSE.
Belladonnæ Liq. ..	Belladonna root, alcohol (90%), and water.	0·75% alkaloids.	—
Cascaræ Sagradæ Liq.	Cascara sagrada, water and alcohol (90%).	1 in 1.	$\frac{1}{2}$ to 1 dr.
Cimicifugæ Liq. ..	Cimicifuga and alcohol (90%).	1 in 1.	5 to 30 min.
Cinchonæ Liq. ..	Red cinchona bark, hydrochloric acid, glycerin, alcohol (90%), and water.	1 in 1, or 5% alkaloids.	5 to 15 min.
Cocæ Liq. ..	Coca leaves and alcohol (60%).	1 in 1.	$\frac{1}{2}$ to 1 dr.
Ergotæ Liq. ..	Ergot, water, and alcohol (90%).	1 in 1.	10 to 30 min.
Filicis Liq. ..	Male fern (dried rhizome), and ether.	10 yield 1.	45 to 90 min.
Glycyrrhizæ Liq. ..	Liquorice root, water and alcohol (90%).	S.G. 1·20.	$\frac{1}{2}$ to 1 dr.
Hamamelidis Liq. ..	Hamamelis leaves and alcohol (45%).	1 in 1.	5 to 15 min.
Hydrastis Liq. ..	Hydrastis rhizome and alcohol (45%).	1 in 1.	5 to 15 min.
Ipecacuanhæ Liq. ..	Ipecacuanha root, slaked lime and alcohol (90%).	2 to 2·25% alkaloids.	$\frac{1}{2}$ to 2 min. as an expectorant; 15 to 20 min. as an emetic.
Jaborandi Liq. ..	Jaborandi leaves and alcohol (45%).	1 in 1.	5 to 15 min.
Nucis Vomicaæ Liq. ..	Nux Vomica seeds, alcohol (70%), and alcohol (90%).	1·5% strychnine	1 to 3 min.
Opii Liq. ..	Extract of opium, water, and alcohol (90%).	$\frac{1}{2}$ in 20. ·7 to ·8% morphine.	5 to 30 min.
Pareiræ Liq. ..	Pareira root, boiling water, and alcohol (90%).	25% extractives.	$\frac{1}{2}$ to 2 drs.
Sarzæ Liq. ..	Sarsaparilla, alcohol (20%), and glycerin.	1 in 1.	2 to 4 drs.
Taraxaci Liq. ..	Dry dandelion root, alcohol (60%), and water.	1 in 1.	$\frac{1}{2}$ to 2 drs.

Abstracts are alcoholic extracts mixed with an inert powder, evaporated to dryness and powdered. They are not mentioned in the B.P., but the Dry Extract of *Euonymus* and Extract of *Strophanthus* are abstracts.

EXTRACTS.

EXTRACTUM.	SOURCE.	MENSTRUUM USED.	DOSE.
Aloes Barb. ..	Barbados aloes, in fragments.	Boiling water.	1 to 4 grs.
Anthemidis ..	☛ The dried flowers and essential oil.	Do.	2 to 8 grs.
Bellad. Alcohol. .. (1% Alkaloids.)	Liquid extract of belladonna.	Sugar of milk.	$\frac{1}{4}$ to 1 gr.
Belladonnæ Viride	Juice of the fresh leaves and young branches.	None.	$\frac{1}{4}$ to 1 gr.
Cannabis Indicæ ..	The dried flowering tops.	Alcohol (90%).	$\frac{1}{4}$ to 1 gr.
Cascaræ Sagradæ	The powdered bark.	Cold water.	2 to 8 grs.
Colchici ..	Juice of the fresh corms.	None.	$\frac{1}{4}$ to 1 gr.
Colocynth. Comp.	Pulp of colocynth, extract of Barbados aloes, scammony resin, curd soap, and cardamoms.	Alcohol (60%).	2 to 8 grs.
Ergotæ (Ergotin)	Sclerotium or spawn of <i>claviceps purpurea</i> .	Alcohol (60%), water, diluted hydrochloric acid, and sodium carbonate.	2 to 8 grs.
Euonymi Siccum	The powdered bark.	Alcohol (45%) and calcium phosphate.	1 to 2 grs.
Gentianæ	The sliced root, dried.	Cold water.	2 to 8 grs.
Glycyrrhizæ ..	The dried powdered root.	Cold water.	—
Hyoscyami Viride	Juice of fresh leaves and branches.	None.	2 to 8 grs.
Jalapæ	The dried powdered root.	Alcohol (90%) and water.	2 to 8 grs.
Kramerizæ ..	The dried powdered root.	Cold water.	5 to 15 grs.
Nucis Vomizæ .. (5% Strychnine.)	Liquid extract of <i>nux vomica</i> .	Sugar of milk.	$\frac{1}{4}$ to 1 gr.
Opil (20% Morphine.)	Opium sliced.	Cold water.	$\frac{1}{4}$ to 1 gr.
Physostigmatis ..	The dried powdered bean.	Alcohol (90%) and milk sugar.	$\frac{1}{4}$ to 1 gr.
Rhei	The dried powdered root.	Alcohol (60%).	2 to 8 grs.
Stramonii ..	The dried coarsely powdered seeds.	Alcohol (70%).	$\frac{1}{4}$ to 1 gr.
Strophanthi ..	The seeds coarsely powdered and dried at 110° F.	Purified ether, alcohol (90%), and milk sugar.	$\frac{1}{4}$ to 1 gr.
Taraxaci	The juice of the fresh root.	None.	5 to 15 grs.

The Alcoholic Extracts (11 in number) are prepared by exhausting the substance with alcohol of varying strength, and subsequent evaporation after the alcohol has been regained by distillation. The student should note that there are *two semi-solid* extracts of Belladonna, one a Green or Fresh extract, and the other a more active drug prepared from the liquid extract, and known as the Alcoholic extract. The latter preparation is standardised (1 per cent. alkaloids), whilst the green extract is not made to contain any definite amount of alkaloid. Nux Vomica also is prepared from its liquid extract, Sugar of Milk being added to give an alkaloidal strength of 5 per cent.

No extract has now a maximum dose less than 1 grain. Nine are $\frac{1}{4}$ to 1 grain—namely, Alcoholic and Green Belladonna, Indian Hemp, Colchicum, Nux Vomica, Opium, Calabar Bean, Stramonium, and Strophanthus. The Pharmacopœia gives no doses for Extracta Belladonnæ Liq. and Glycyrrhizæ, the former being a very powerful drug, and the latter practically inert.

Glycerina (Glycerins—9 in number) are solutions of the drug bearing the name, in glycerin or in glycerin and water.

The fact of the solid constituents being weighed, and the fluid ones being measured, leads to difficulties in stating accurately their strengths. All are fluid except Glycerina Amyli and Tragacanthæ.

GLYCERINS.

GLYCERINUM.	INGREDIENTS.	STRENGTH BY WEIGHT.	STRENGTH BY VOLUME.
Acidi Borici ..	Boric acid and glycerin.	6 in 20.	6 in 16.
Acidi Carbolic ..	Phenol and glycerin.	1 in 6 $\frac{1}{4}$.	1 in 5.
Acidi Tannici ..	Tannic acid and glycerin.	1 in 6 $\frac{1}{4}$.	1 in 5.
Aluminis	Alum, glycerin, and water.	1 in 7 $\frac{1}{2}$.	1 in 6.
Amyli	Starch, glycerin, and water.	1 in 10.	1 in 9.
Boracis	Borax and glycerin.	1 in 8 $\frac{1}{2}$.	1 in 6 $\frac{1}{2}$.
Pepsini	Pepsin, hydrochloric acid, glycerin and water.	—	5 grs. in 1 dr.
Plumbi Subacetatis	Lead acetate and oxide, glycerin and water.	1 in 6.	1 in 4.
Tragacanthæ ..	Tragacanth, glycerin, and water.	1 in 5 $\frac{1}{4}$.	—

Infusa (Infusions—22 in number) are watery solutions of vegetable principles prepared without boiling. 20 are prepared by pouring boiling distilled water on the vegetable properly comminuted, and placed in a suitable pot with a covered lid, and allowed to stand a definite short time.

INFUSIONS.

INFUSUM.	INGREDIENTS.	STRENGTH.	TIME.	DOSE.
Aurantii ..	Dried bitter-orange peel cut small and boiling water.	1 in 20.	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.
Aurantii Co.	Dried bitter-orange peel cut small, fresh lemon peel cut small, cloves bruised, and boiling water.	1 in 40.	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.
Buchu ..	Leaves freshly broken and boiling water.	1 in 20.	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.
Calumbæ ..	Root thinly sliced and <i>cold</i> water.	1 in 20.	$\frac{1}{2}$ hour.	$\frac{1}{2}$ to 1 oz.
Caryophylli	Cloves bruised and boiling water.	1 in 40.	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.
Cascarillæ	Bark powdered and boiling water.	1 in 20.	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.
Chiratæ ..	Chiretta cut small and boiling water.	1 in 20.	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.
Cinch. Acid.	Red bark powdered, aromatic sulphuric acid, and boiling water.	1 in 20.	1 hour.	$\frac{1}{2}$ to 1 oz.
Cuspariæ ..	Bark powdered and boiling water.	1 in 20.	$\frac{1}{4}$ hour.	1 to 2 oz.
Digitalis ..	Leaves powdered and boiling water.	60 grs. in 1 pt., or 1 in 160.	$\frac{1}{4}$ hour.	2 to 4 drs.
Ergotæ ..	Ergot freshly crushed and boiling water.	1 in 20.	$\frac{1}{4}$ hour.	1 to 2 oz.
Gentianæ Co.	Root thinly sliced, dried bitter-orange peel cut small, fresh lemon peel cut small, and boiling water.	1 in 80.	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.
Krameriæ	Root bruised and boiling water.	1 in 20.	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.
Lupuli ..	Hops freshly broken and boiling water.	1 in 20.	$\frac{1}{4}$ hour.	1 to 2 oz.
Quassiæ ..	Wood finely rasped, <i>cold</i> water.	1 in 100.	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.
Rhei ..	Root in thin slices, boiling water.	1 in 20.	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.
Rosæ Acidum	Red-rose petals dried and broken, diluted sulphuric acid, and boiling water.	1 in 40.	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.
Scoparii ..	Tops dried and bruised and boiling water.	1 in 10.	$\frac{1}{4}$ hour.	1 to 2 oz.
Senegæ ..	Root powdered and boiling water.	1 in 20.	$\frac{1}{2}$ hour.	$\frac{1}{2}$ to 1 oz.
Sennæ ..	Senna, ginger sliced, and boiling water.	1 in 10.	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz. as draught 2 oz.
Serpentariæ	Rhizome powdered and boiling water.	1 in 20.	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.
Uvæ Ursi	Leaves bruised and boiling water.	1 in 20.	$\frac{1}{4}$ hour.	$\frac{1}{2}$ to 1 oz.

Two—Quassia and Calumba—are prepared with cold water. All will darken on the addition of persalts of iron, except Quassia and Calumba, and all should be prepared fresh. All are directed to be strained. The product should not be made to measure any particular quantity. All infusions are made with 1 pint water. The most important infusion for the student to remember is Digitalis. It contains 60 grains to a pint, and the dose is only 2 to 4 drachms. 14 are made with 1 ounce of the vegetable; 3—Compound Orange, Caryophylli, and Acid Rose—with $\frac{1}{2}$ ounce; 1—Compound Gentian—with $\frac{1}{4}$ ounce; 2—Broom and Senna—with 2 ounces; and Quassia with 88 grains. All the infusions are to stand for $\frac{1}{4}$ of an hour except Calumba and Senega ($\frac{1}{2}$ hour), and Cinchona Acidum (1 hour).

In the preparation of an infusion only distilled water should be employed, and it is a matter of considerable importance that the water should be placed in the vessel in which it is to be boiled and briskly heated, and when ebullition occurs it should at once be poured upon the vegetable substance. Previous prolonged boiling of the water gives a much less satisfactory product, as all the gases in the liquid are expelled by protracted boiling.

There are 5 Infusions which are really compound preparations, containing more than one ingredient; they are—Aurantii Co., Cinchonæ Acid., Gentianæ Co., Rosæ Acid., and Sennæ, though the student will note that the title compound is only conferred upon two of them—viz., Gentian and Orange.

Injectiones Hypodermicæ.—There are 4 preparations under this head in the Pharmacopœia. In each the vehicle is boiled and cooled before the drug is dissolved. Apomorphine and Ergot are ordered to be recently prepared.

HYPODERMIC INJECTIONS.

INJECTIO HYPODERMICA.	COMPOSITION.	STRENGTH.	DOSE.
Apomorphinæ	Hydrochloride of apomorphine, 1 gr.; diluted hydrochloric acid, 1 minim; water, to 110 mins.	1 gr. in 110 mins.	5 to 10 mins.
Cocainæ ..	Cocaine hydrochloride, 33 grs.; salicylic acid, $\frac{1}{4}$ gr.; distilled water, to 6 fl. drs.	10 grs. in 110 mins.	2 to 5 mins.
Ergotæ ..	Extract of ergot, 100 grs.; phenol, 3 grs.; water, to 330 mins.	33 grs. in 110 mins.	3 to 10 mins.
Morphinæ ..	Morphine tartrate, 50 grs.; water, q.s. to 1,100 mins.	5 grs. in 110 mins.	2 to 5 mins.

Lamellæ (Discs) are 4 in number—

Lamellæ Atropinæ—Discs of gelatin and some glycerin, each weighing about $\frac{1}{50}$ gr., and containing $\frac{1}{5000}$ gr. atropine sulphate.

Lamellæ Cocainæ—Discs of gelatin, with some glycerin, each weighing about $\frac{1}{30}$ gr., and containing $\frac{1}{30}$ gr. cocaine hydrochloride.

Lamellæ Homatropinæ—Discs of gelatin, with some glycerin, each weighing about $\frac{1}{50}$ gr., and containing $\frac{1}{1000}$ gr. of homatropine hydrobromide.

Lamellæ Physostigminæ—Discs of gelatin, with some glycerin, each weighing about $\frac{1}{50}$ gr., and containing $\frac{1}{1000}$ gr. physostigmine sulphate.

LINIMENTS.

LINIMENTUM.	COMPOSITION.	STRENGTH.
Aconiti ..	20 oz. root, 1 oz. camphor, and alcohol (90%) to 30 oz.	1 in 1½.
Ammoniaæ ..	1 oz. solution of ammonia, 1 oz. almond oil, and 2 oz. olive oil.	1 in 4.
Belladonnæ ..	10 oz. liquid extract, 1 oz. camphor, 2 oz. water, and alcohol (90%) to 20 oz.	1 in 2.
Calcis ..	2 oz. lime water, and 2 oz. olive oil, agitated together.	1 in 2.
Camphoræ ..	1 oz. camphor, in flowers, and 4 oz. olive oil.	1 in 5.
Camphoræ Ammoniatum	2½ oz. camphor, 1 dr. oil of lavender, 5 oz. strong solution of ammonia, and alcohol (90%) to 20 oz.	1 in 8.
Chloroformi ..	2 oz. chloroform, and 2 oz. camphor liniment.	1 in 2.
Crotonis ..	1 oz. croton oil, and 3½ oz. each oil of cajuput and alcohol (90%).	1 in 8.
Hydrargyri ..	1 oz. of mercurial ointment, 160 mins. strong solution of ammonia, and liniment of camphor to 3 oz.	1 of oint. in 3, or 1 of Hg. in 6.
Opii ..	2 oz. tincture of opium, and 2 oz. soap liniment.	1 in 2.
Potassii Iodidi cum Sapone	2 oz. curd soap, 1½ oz. potassium iodide, 1 oz. glycerin, 1 dr. oil of lemon, and 10 oz. distilled water.	54½ grs. in 1 fl. oz. or 1 in 10 by weight.
Saponis ..	2 oz. soft soap, 1 oz. camphor, 3 drs. oil of rosemary, 4 oz. distilled water, and 16 oz. alcohol (90%).	1 in 12.
Sinapis ..	1½ drs. oil of mustard, 120 grs. camphor, 5 drs. castor oil, and 4 oz. alcohol (90%).	1 in 27.
Terebinthinæ	1½ oz. soft soap, 1 oz. camphor, 13 oz. oil of turpentine, and water to 1 pint.	13 in 20.
Terebinth. Acet.	4 oz. oil of turpentine, 1 oz. glacial acetic acid, 4 oz. camphor liniment.	4 in 9.

Linimenta (Liniments or Embrocations—15 in number) are preparations for external application to the skin, and intended to be applied with friction. They are really very thin oint-

ments, though the majority of them are perfectly limpid liquids. The iodide of potassium with soap liniment is a soft solid—like shaving paste. All contain either a fixed or volatile oil, or a soap, camphor entering into 11 of them. Those without camphor are ammonia, lime, croton oil, and iodide of potassium with soap. The old Liniment of Iodine is now called *Liquor Iodi Fortis*.

Liquores (Solutions—53 in number) are solutions of vegetable principles or inorganic substances in distilled water or weak spirit. Three—*Pancreatis*, *Thyroidei*, and *Epispasticus*—come from the animal kingdom. The last named is made with acetic ether. The several vegetable solutions are prepared with alcohol of various strengths.

The following 11 are all of the same strength—1 grain in 110 minims (1 per cent.) ; they are most important preparations :—

<i>Arsenicalis</i> .	<i>Atropinæ Sulph.</i>	<i>Pot. Permang.</i>
<i>Arsenici Hydrochlor.</i>	<i>Morphinæ Tart.</i>	<i>Strychninæ Hydro-</i>
<i>Arsenii et Hyd. Iod.</i>	<i>Morphinæ Hydrochlor.</i>	<i>chlor.</i>
<i>Sodii Arsen.</i>	<i>Morphinæ Acet.</i>	<i>Trinitrini.</i>

LIQUORS OR SOLUTIONS.

LIQUOR.	STRENGTH.	DOSE.
<i>Acid. Chromici</i>	25 per cent. anhydrous.	Used externally.
<i>Ammoniæ</i>	1 in 3. (10 per cent.)	Used externally.
<i>Ammoniæ Fortis</i>	32.5 per cent.	Used externally.
<i>Ammonii Acetatis</i>	about 6½ per cent.	2 to 6 drs.
<i>Ammonii Citratis</i>	nearly 16 per cent.	2 to 6 drs.
<i>Arsenicalis</i>	1 gr. in 110 mins.	2 to 8 m.
<i>Arsenici Hydrochloricus</i>	1 gr. in 110 mins.	2 to 8 m.
<i>Arsenii et Hydr. Iod.</i> ..	1 gr. in 110 mins.	5 to 20 m.
<i>Atropinæ Sulphatis</i>	1 gr. in 110 mins.	½ to 1 m.
<i>Bismuthi et Ammon. Cit.</i>	3 grs. oxide in 1 dr.	½ to 1 dr.
<i>Calcis</i>	½ gr. in 1 oz.	1 to 4 oz.
<i>Calcis Chlorinatæ</i>	about 3 per cent. Cl. when fresh.	—
<i>Calcis Saccharatus</i>	about 8 grs. in 1 oz.	20 to 60 m.
<i>Calumbæ Conc.</i>	1 in 2.	½ to 1 dr.
<i>Caoutchouc</i>	1 to 20.	Used externally.
<i>Chirataæ Conc.</i>	1 in 2.	½ to 1 dr.
<i>Cuspariæ Conc.</i>	1 in 2.	½ to 1 dr.
<i>Epispasticus</i>	1 in 2.	Used externally.
<i>Ethyl Nitritus</i>	2½ to 3 per cent.	20 to 60 m.
<i>Ferri Acetatis</i>	almost 10 per cent.	5 to 15 m.
„ <i>Perchloridi</i>	1 in 4.	5 to 15 m.
„ „ Fortis	1 oz. iron in 5.	—

LIQUORS OR SOLUTIONS—(continued).

LIQUOR.	STRENGTH.	DOSE.
Ferri Pernitratiss	1 oz. iron in 30.	5 to 15 m.
„ Persulphatis	36 per cent.	—
Hamamelidis	1 in 1.	Used externally.
Hydrargyri Nit. Acidus ..	48 per cent.	Used externally.
Hydrargyri Perchloridi ..	$\frac{1}{2}$ gr. in 1 oz.	$\frac{1}{2}$ to 1 dr.
Hydrogenii Peroxidi	10 of oxygen in 1.	$\frac{1}{2}$ to 2 drs.
Iodi Fortis	1 in 9.	Used externally.
Kramerie Conc.	1 in 2.	$\frac{1}{2}$ to 1 dr.
Magnesii Carbonatis	nearly 10 grs. in 1 oz.	1 to 2 oz.
Morphinæ Acetatis	1 gr. in 110 mins.	10 to 60 m.
Morphinæ Hydrochloridi ..	1 gr. in 110 mins.	10 to 60 m.
Morphinæ Tartratis	1 gr. in 110 mins.	10 to 60 m.
Pancreatis	1 in 4.	—
Picis Carbonis	1 in 6.	Used externally.
Plumbi Subacetatis Fortis	24 per cent.	Used externally.
„ „ Dilutus	1 in 80.	Used externally.
Potassæ	27 grs. in 1 oz.	10 to 30 m.
Potassii Permanganatis ..	1 gr. in 110 mins.	2 to 4 drs.
Quassie Conc.	1 in 10.	$\frac{1}{2}$ to 1 dr.
Rhei Conc.	1 in 2.	$\frac{1}{2}$ to 1 dr.
Sarzæ Co. Conc.	1 in 1.	2 to 8 drs.
Senegæ Conc.	1 in 2.	$\frac{1}{2}$ to 1 dr.
Sennæ Conc.	1 in 1.	$\frac{1}{2}$ to 1 dr.
Serpentariæ Conc.	1 in 2.	$\frac{1}{2}$ to 2 drs.
Sodæ Chlorinatæ	2 $\frac{1}{2}$ per cent. Cl.	10 to 20 m.
Sodii Arsenatis	1 gr. in 110 mins.	2 to 8 m.
Sodii Ethylatis	18 per cent.	Used externally.
Strychninæ Hydrochloridi	1 gr. in 110 mins.	2 to 8 m.
Thyroidei	100 mins. = 1 gland.	5 to 15 m.
Trinitrini	1 gr. in 110 mins.	$\frac{1}{2}$ to 2 m.
Zinci Chloridi	46 grs. in 1 dr.	Used externally.

44 The Concentrated Liquors of Calumba, Chiretta, Cusparia, Krameria, Quassia, Rhubarb, Sarsaparilla, Senega, Senna, and Serpentry, are introduced obviously as representatives of the class of "Concentrated Infusions," and could be advantageously omitted from the next B.P.

Lotiones (Lotions—2 in number) are liquid preparations for external application.

Lotio Hydrargyri Flava, 20 grs. corrosive sublimate and 10 ozs. lime water.

Lotio Hydrargyri Nigra, 30 grs. calomel, $\frac{1}{2}$ oz. glycerin, 1 $\frac{1}{4}$ oz. mucilage of tragacanth, and lime water, to 10 ozs.

Mella (Honeys—4 in number) are preparations of honey.

Mel Depuratum—Honey melted and strained through flannel.

Mel Boracis—1 oz. powdered borax mixed with 8 ozs. clarified honey, and $\frac{1}{2}$ oz. glycerin.

Oxymel—40 ozs. clarified honey, 5 ozs. acetic acid, and distilled water (about 5 ozs.) to give a S.G. of 1.32. Dose—1 to 2 drs.

Oxymel Scillæ— $2\frac{1}{2}$ ozs. squill, $2\frac{1}{2}$ ozs. acetic acid, 8 ozs. water, macerated for 7 days, and the product mixed with clarified honey, liquefied (about 27 fluid ozs.), to give S.G. 1.32. Dose— $\frac{1}{2}$ to 1 dr.

Misturæ (Mixtures—9 in number).

MISTURA.	COMPOSITION.	STRENGTH PER OZ.
Ammoniaci ..	$\frac{1}{4}$ oz. ammoniacum rubbed up with $7\frac{1}{2}$ oz. water, and 4 drs. syrup of tolu, and strained.	13 $\frac{1}{2}$ grs.
Amygdalæ ..	2 oz. compound powder of almonds and 16 oz. water, and strained.	54 grs.
Creosoti ..	16 mins. each creosote and spirit of juniper, 1 oz. syrup, and water to 16 oz.	1 min.
Cretæ ..	$\frac{1}{4}$ oz. prepared chalk, 15 grs. tragacanth in powder, $\frac{1}{2}$ oz. sugar, and cinnamon water to 8 oz.	13 $\frac{1}{2}$ grs.
Ferri Comp. ..	25 grs. ferrous sulphate, 30 grs. potassium carbonate, 60 grs. each myrrh and sugar, 50 mins. spirit of nutmeg, rose water to 10 oz.	2 $\frac{1}{2}$ grs.
Guaiaci ..	$\frac{1}{2}$ oz. guaiacum resin, $\frac{1}{2}$ oz. sugar, 35 grs. tragacanth powdered, and 1 pt. cinnamon water.	11 grs.
Olei Ricini ..	3 oz. castor oil, 1 $\frac{1}{2}$ oz. mucilage of acacia, 1 oz. orange flower water, and 2 $\frac{1}{2}$ oz. cinnamon water.	3 drs.
Sennæ Comp.	5 oz. magnesium sulphate, 1 oz. liq. extract of liquorice, 1 oz. aromatic spirit of ammonia, 2 oz. compound tincture of cardamoms, infusion of senna to 1 pint.	$\frac{1}{4}$ oz. mag. sulph.
Spt. Vini Gallici	4 oz. each brandy and cinnamon water, the yolks of 2 eggs, $\frac{1}{2}$ oz. sugar.	3 drs.

The formula of each of the official mixtures may be regarded as a carefully-written recipe in which a mixture is ordered, the ingredients being mostly in suspension. The dose is the same for all—from $\frac{1}{2}$ to 1 or 2 ounces.

The Mistura Sennæ Co. is the official representative of "Black Draught," and may be more correctly regarded as a

magnesium sulphate preparation, with the infusion of senna added as an adjuvans.

Mucilagines (Mucilages—2 in number) are watery solutions or mixtures containing a gum.

Mucilago Acaciæ—4 ozs. gum acacia rinsed with a little distilled water and then dissolved in 6 ozs. distilled water.

Mucilago Tragacanthæ—60 grs. of the powdered gum mixed with 2 drs. alcohol (90 per cent.) and distilled water added to make 10 ozs.

These preparations are of no therapeutical interest, being merely introduced as excipients or vehicles with the intention of being prescribed in mixtures containing insoluble metallic salts or insoluble vegetable powders, to assist their suspension in the liquid medium. They are used as excipients in pill making, and are employed in the various methods of pill coating.

Olea (Oils).—Under this name there are 33 substances in the Pharmacopœia. They may be divided into two well-marked classes—fixed and volatile—the fixed being obtained by expression (hence sometimes called expressed oils), and the volatile (sometimes termed distilled oils), being products of distillation, except in the case of *Ol. Limonis*, a vegetable oil, which is volatile though usually obtained by expression. In addition to these, which are only known as oils, there are others in the Pharmacopœia equally deserving the name, as camphor, which is a volatile oil; lard, wool fat, beeswax, suet, and spermaceti, which are fixed.

Of the 33 oils, one is an animal product—cod-liver oil—which is a fixed oil, and, omitting lemon, six are expressed—Almond, Croton, Linseed, Olive, Castor, and Theobroma; Cade is obtained by *destructive* distillation. Theobroma is solid, and Oil of Rose is semi-solid.

As a rule, they vary from colourlessness through straw and yellow to a pale brown, but cajuput is a deep green colour, and cade is nearly black.

Cloves, cinnamon, pimento, and mustard oils *sink* in water.

The dose of each of the volatile oils is, speaking generally, about $\frac{1}{2}$ to 3 minims. The oil of mustard is a powerful poison, and should only be used externally. Of the fixed oils, croton is only given in doses of $\frac{1}{2}$ to 1 minim, while of the remaining five an ounce may be given of each.

The volatile oils are added to the official pill masses for two reasons—to correct griping, and to serve as a means of distinguishing the various pill masses from each other by their odour.

OILS.

OLEUM.	SOURCE AND HOW PREPARED.	DOSE.
Amygdalæ ..	Expressed from bitter or sweet almonds.	—
Anethi ..	Distilled from dill fruit.	$\frac{1}{2}$ to 3 mins.
Anisi ..	Distilled from the fruit of anise or star-anise.	$\frac{1}{2}$ to 3 mins.
Anthemidis ..	Distilled from the flowers.	$\frac{1}{2}$ to 3 mins.
Cadinum ..	Obtained by the <i>destructive</i> distillation of the wood of juniperus oxycedrus and other species.	Used externally.
Cajuputi ..	Distilled from the leaves.	$\frac{1}{2}$ to 3 mins.
Carui ..	Distilled from the fruit.	$\frac{1}{2}$ to 3 mins.
Caryophylli ..	Distilled from the flower buds.	$\frac{1}{2}$ to 3 mins.
Cinnamomi ..	Distilled from cinnamon bark.	$\frac{1}{2}$ to 3 mins.
Copaibæ ..	Distilled from copaiba.	5 to 20 mins.
Coriandri ..	Distilled from the fruit.	$\frac{1}{2}$ to 3 mins.
Crotonis ..	Expressed from the seeds.	$\frac{1}{2}$ to 1 min.
Cubebæ ..	Distilled from the unripe fruit.	5 to 20 mins.
Eucalypti ..	Distilled from the fresh leaves.	$\frac{1}{2}$ to 3 mins.
Juniperi ..	Distilled from the unripe fruit.	$\frac{1}{2}$ to 3 mins.
Lavandulæ ..	Distilled from the flowers.	$\frac{1}{2}$ to 3 mins.
Limonis ..	Expressed from the fresh peel.	$\frac{1}{2}$ to 3 mins.
Lini ..	Expressed without heat from the seeds.	Used externally.
Menthæ Pip- ritæ	Distilled from the fresh flowering herb.	$\frac{1}{2}$ to 3 mins.
Menthæ Viridis	Distilled from the fresh flowering herb.	$\frac{1}{2}$ to 3 mins.
Morrhue ..	Extracted by a heat under 180° from the fresh liver.	1 to 4 drs.
Myristicæ ..	Distilled from the dried seeds.	$\frac{1}{2}$ to 3 mins.
Olivæ ..	Expressed from the ripe fruit.	—
Phosphoratum	Expressed oil of almonds and phosphorus, heated to 180° .	1 to 5 mins.
Pimentæ ..	Distilled from the unripe berry.	$\frac{1}{2}$ to 3 mins.
Pini ..	Distilled from the fresh leaves.	—
Ricini ..	Expressed from the seeds.	1 to 8 drs.
Rosæ ..	Distilled from the fresh flowers.	—
Rosmarini ..	Distilled from the flowering tops.	$\frac{1}{2}$ to 3 mins.
Santali ..	Distilled from the wood.	5 to 30 mins.
Sinapis Volatile	Distilled from the black seeds, after maceration with water.	Used externally.
Terebinthinæ ..	Distilled usually by aid of steam from the oleo-resin.	2 to 10 mins. 3 to 4 drs. (as anthelmintic.
Theobromatis	Expressed with heat from the ground seeds.	—

Pilulæ (Pills—20 in number) are soft solid masses, capable of being easily moulded into little globular forms. More than the half of them are purgative, and the dose is generally 4 to 8 grains. The dose of Pil. Phosphori is only 1 to 2 grains, of Pil. Saponis Co. and of Pil. Plumbi C. Opio 2 to 4 grains, of Pil. Quininæ 2 to 8 grains, and of Pil. Ferri 5 to 15 grains.

PILLS.

PILULA.	INGREDIENTS.	STRENGTH.
Aloes Barbadosis	Barbados aloes, hard soap, oil of caraway, and confection of roses.	1 in 2.
Aloes et Asafetidæ	Socotrine aloes, asafetida, hard soap, and confection of roses.	1 in 4.
Aloes et Ferri ..	Exsiccated ferrous sulphate, Barbados aloes, compound powder of cinnamon, and syrup of glucose.	2 and 1 in 9.
Aloes et Myrrhæ ..	Socotrine aloes, myrrh, and syrup of glucose.	2 and 1 in 4½.
Aloes Socotrinæ ..	Socotrine aloes, hard soap, volatile oil of nutmeg, and confection of roses.	1 in 2.
Cambogiæ Comp.	Gamboge, Barbados aloes, hard soap, compound powder of cinnamon, and syrup of glucose.	1 in 6.
Colocynth. Comp.	Colocynth, Barbados aloes, scammony resin, potassium sulphate, oil of cloves, and water.	1 in 6.
Colocynthis et Hyoseyami	Compound colocynth pill and extract of hyoseyamus.	2 and 1 in 3.
Ferri	Dried ferrous sulphate, dried sodium carbonate, acacia, tragacanth, syrup, glycerin, and distilled water.	1 in 5.
Galbani Comp. ..	Asafetida, galbanum, myrrh, and syrup of glucose.	1 in 3½.
Hydrargyri ..	Mercury, confection of roses, and powdered liquorice.	1 in 3.
Hydrarg. Subchlor. Comp.	Calomel, sulphurated antimony, guaiacum resin, castor oil, and alcohol (90%).	1 in 4½.
Ipecacuanhæ cum Scilla	Dover's powder, squill, ammoniacum, and syrup of glucose.	1 in 20.
Phosphori ..	Phosphorus, white beeswax, lard, kaolin, carbon bisulphide, gum acacia.	1 in 50.
Plumbi cum Opio	Lead acetate, opium, syrup of glucose.	6 and 1 in 8.
Quininæ Sulphatis	Quinine sulphate, tartaric acid, glycerin, tragacanth.	5 in 6.
Rhei Comp. ..	Rhubarb, socotrine aloes, myrrh, hard soap, oil of peppermint, and syrup of glucose.	1 in 3½.
Saponis Comp. ..	Opium, hard soap, and syrup of glucose.	1 in 5 (of opium).
Scammonii Comp.	Resins of scammony and jalap, curd soap, and tincture of ginger.	1 in 3½.
Scillæ Comp. ..	Squill, ginger, ammoniacum, hard soap, and syrup of glucose.	1 in 4½.

Nearly all the pill masses are dark brown or black in colour, only a few can be distinguished by sight—thus Pil. Hydrarg. is *blue* ; Hyd. Subchlor. Co. a *bright orange* ; and Quininæ Sulph. *white*. The majority are distinguishable by smell—thus, Colocynth is known by its odour of cloves ; Barbados aloes by its caraway ; Socotrine aloes by its nutmeg ; Aloes et Asafetidæ

by its powerful fetid odour; whilst in Pil. Galbani Co. the myrrh almost conceals the stinking gum; Pil. Cambogiæ smells strongly of Barbados aloes, and is not of the yellow colour which the student might expect; Pil. Scillæ Co. is known by the odour of its ammoniacum; Saponis by its tawny colour and opium smell; Rhubarb by its peppermint; and Lead and Opium by the odour of acetic acid.

Pulveres (Powders) are 16 in number—

PULVIS.	INGREDIENTS.	DOSE IN GRAINS.	STRENGTH.
Amygdalæ Comp. ..	Sweet almonds, refined sugar, and acacia gum.	—	8 in 13.
Antimonialis	Antimonious oxide and calcium phosphate.	3 to 6.	1 in 3.
Catechu Comp. ..	Catechu, kino, krameria, cinnamon, and nutmeg.	10 to 40.	1 in 2½.
Cinnamomi Comp. ..	Cinnamon, cardamoms, and ginger.	10 to 40.	1 in 3.
Cretæ Aromaticus	Cinnamon, nutmeg, cloves, cardamoms, sugar, and chalk.	10 to 60.	1 in 4.
Cretæ Aromat. C. Opio	Aromatic chalk powder, and opium.	10 to 40.	1 in 40 (opium).
Elaterini Comp. ..	Elaterin and milk sugar.	1 to 4.	1 in 40.
Glycyrrhizæ Comp. ..	Senna, liquorice root, sugar, fennel fruit, and sulphur.	60 to 120.	1 in 6.
Ipecacuanhæ Comp.	Ipecacuanha, opium, and potassium sulphate.	5 to 15.	1 in 10.
Jalapæ Comp. ..	Jalap, cream of tartar, and ginger.	20 to 60.	1 in 3.
Kino Comp.	Kino, opium, and cinnamon.	5 to 20.	1 in 20 (opium).
Opii Comp.	Opium, black pepper, ginger, caraway, and tragacanth.	2 to 10.	1 in 10.
Rhei Comp.	Rhubarb, light (or heavy) magnesia, and ginger.	20 to 60.	1 in 4½.
Scammonii Comp. ..	Scammony resin, jalap, and ginger.	10 to 20.	1 in 2.
Sodæ Tart. Efferves. (Seidlitz Powder.)	Tartarated soda 120 grs., sodium bicarbonate 40 grs. in blue paper; tartaric acid 38 grs. in white paper.	198.	120, 40, and 38.
Tragacanthæ Comp.	Tragacanth, gum acacia, starch, and sugar.	20 to 60.	1 in 6.

The official powders are called "compound" except 4—Antimonial, Aromatic Chalk, Aromatic Chalk with Opium, and Seidlitz Powder. They can be for the most part distinguished

by their colour, which is given with the exact weight of each constituent under the name of the drug, in the "Materia Medica." The student cannot, however, depend upon colour *alone*, as cinnamon, aromatic chalk, aromatic chalk with opium, ipecacuanha, jalap, rhubarb, and scammony closely resemble each other, only differing by very faint gradations of colour. The smell, along with the colour, will distinguish most of them—thus, the odour of opium distinguishes the aromatic chalk and opium powder from the plain aromatic chalk.

SPIRITS.

SPIRITUS.	COMPOSITION.	STRENGTH.	DOSE.
Ætheris	Ether and alcohol (90%).	1 in 3.	20 to 40 m. or 60 to 90 m.
Ætheris Compositus (Hoffman's Anodyne.)	Ethereal oil, ether, and alcohol (90%).	S. G. ·808 to ·812	20 to 40 m. or 60 to 90 m.
Ætheris Nitrosi ..	An alcoholic solution containing ethyl nitrite, aldehyde, and other substances.	S. G. ·838 to ·842	20 to 40 m. or 60 to 90 m.
Ammoniæ Aromat.	Carbonate, strong solution of ammonia, oil of nutmeg, oil of lemon, alcohol (90%), and water.	1 in 40. (Carbonate.) 1 in 20. (Liq. Am. F.)	20 to 40 m. or 60 to 90 m.
Ammoniæ Fetidus	Asafetida, strong solution of ammonia, and alcohol (90%).	1½ in 20.	20 to 40 m. or 60 to 90 m.
Anisi	Oil of anise and alcohol (90%).	1 in 10.	5 to 20 m.
Armoraciæ Compos.	Horseradish root, bitter orange peel, nutmeg, alcohol (90%), and water.	1 in 8.	1 to 2 drs.
Cajuputi	Oil of cajuput and alcohol (90%).	1 in 10.	5 to 20 m.
Camphoræ ..	Camphor and alcohol (90%).	1 in 10.	5 to 20 m.
Chloroformi ..	Chloroform and alcohol (90%).	1 in 20.	5 to 20 or 30 to 40 m.
Cinnamomi ..	Oil of cinnamon and alcohol (90%).	1 in 10.	5 to 20 m.
Juniperi	Oil of juniper and alcohol (90%).	1 in 20.	20 to 60 m.
Lavandulæ ..	Oil of lavender and alcohol (90%).	1 in 10.	5 to 20 m.
Menthæ Piperitæ	Oil of peppermint and alcohol (90%).	1 in 10.	5 to 20 m.
Myristicæ ..	Oil of nutmeg and alcohol (90%).	1 in 10.	5 to 20 m.
Rectificatus ..	Alcohol, with 10% of water.	90%	—
Rosmarini ..	Oil of rosemary and alcohol (90%).	1 in 10.	—
Vini Gallici (Brandy.)	Spirit distilled from wine.	43½% ethyl hydrate.	—

Spiritus (Spirits—of which there are 18 in number) are for the most part alcoholic solutions of a volatile oil. The student should remember that all are colourless when freshly prepared, except brandy and cajuput.

Six spirits, it will be noticed, have two ranges of doses given ; the larger is for a single dose, the smaller for repeated administration.

Spiritus Rectificatus is Alcohol (90 per cent.), and from it the diluted alcohols are prepared. Spirits of juniper and nutmeg are ordered, if not clear, to be shaken with a little powdered talc and filtered.

Succi (Juices—6 in number).—Lemon juice is the *freshly* expressed juice which is used to make the syrup, the remaining five, which are regarded as the juices proper, are prepared by adding 1 measure of alcohol (90 per cent.) to 3 measures of the freshly expressed juice of the recently collected plants.

SUCCUS.	SOURCE.	DOSE.
Belladonnæ ..	Fresh leaves and young branches.	5 to 15 mins.
Conii ..	Fresh leaves and young branches.	1 to 2 drs.
Hyoscyami ..	Fresh leaves, flowering tops, and young branches.	$\frac{1}{2}$ to 1 dr.
Limonis ..	The ripe fruit.	—
Scoparii ..	Fresh tops.	1 to 2 drs.
Taraxaci ..	Fresh root.	1 to 2 drs.

Suppositoria (Suppositories—7 in number) are small, solid masses, weighing about 15 grains and of conical shape, containing some active ingredient blended with a fatty or gelatin basis for introduction into the rectum. The glycerin suppository is made to weigh 30, 60, or 120 grains each.

SUPPOSITORIA.	INGREDIENTS.	STRENGTH.
		<i>Grs. in each.</i>
Acidi Carbolici ..	Phenol, white beeswax, and oil of theobroma.	1 gr.
Acidi Tannici ..	Tannic acid and oil of theobroma.	3 grs.
Belladonnæ ..	Alcoholic extract of belladonna, glycerin, and oil of theobroma.	1½ grs. each = $\frac{1}{100}$ gr. alkaloids.
Glycerini ..	Gelatin, glycerin, and water.	70%.
Iodoformi ..	Iodoform and oil of theobroma.	3 grs.
Morphinæ ..	Morphine hydrochloride and oil of theobroma.	$\frac{1}{4}$ gr.
Plumbi Composita	Lead acetate, opium, and oil of theobroma.	3 grs. and 1 gr. opium.

Syrupi (Syrups—22 in number).—Half of them are merely strong solutions of sugar, charged with some harmless flavouring or colouring agent; the remainder are saccharine solutions of more or less active drugs in a pleasant but not very stable form. 14 are of vegetable origin. They are mostly—the S.G. being generally about 1.33— $\frac{1}{3}$ heavier than water, and loaf sugar only is used in their preparation, and the water that enters into their composition is to be distilled; the dose averages 1 drachm.

SYRUPS.

SYRUPUS.	INGREDIENTS.	STRENGTH (BY VOLUME).
Syrupus	Sugar, 5 lbs., water q.s. to 7½ lbs.	1 in 1½.
Aromaticus	Tincture of orange 5, cinnamon water 5, syrup 10.	—
Aurantii	Syrup and tincture of orange.	1 in 8.
Aurantii Floris	Orange flower water, sugar, and water.	1 in 6½.
Calcei Lactophosphatis	Calcium carbonate, lactic acid, concentrated phosphoric acid, sugar, orange flower water, water.	—
Cascaræ Aromaticus	Liquid extract of cascara sagrada, tincture of orange, alcohol (90%), cinnamon water, syrup.	1 in 2½.
Chloral	Chloral hydrate, syrup, and water.	1 in 6.
Codeinæ	Codeine phosphate, water, syrup.	1 in 240.
Ferri Iodidi	Iron wire, iodine, sugar and water, 1 gr. in 11 minims.	1 in 11.
Ferri Phosphatis	Iron wire, concentrated phosphoric acid, syrup, water.	1 in 60.
Ferri Phosphatis cum Quinina et Strychnina	Iron wire, concentrated phosphoric acid, strychnine, quinine sulphate, syrup, and water.	1, $\frac{4}{5}$, and $\frac{1}{32}$ gr. in 1 dr.
Glucosi	Syrup and liquid glucose.	1 in 3.
Hemidesmi	Hemidesmus root sugar, and water.	1 in 8.
Limonis	Fresh lemon peel, juice, alcohol (90%), and sugar.	1 in 2.
Pruni Virginianæ	Virginian prune bark, sugar, glycerin, water.	3 in 20.
Rhei	Rhubarb root, coriander fruit, sugar, alcohol (90%), and water.	1 in 15.
Rhœados	Fresh red poppy petals, sugar, water, and alcohol (90%).	1 in 3½.
Rosæ	Dried red rose petals, sugar, and water.	1 in 17.
Scillæ	Vinegar of squill and sugar.	1 in 17. (of squill).
Sennæ	Senna, oil of coriander, sugar, water, and alcohol (90%).	1 in 2.
Tolutanus	Balsam of tolu, sugar, and water.	1 in 29.
Zingiberis	Ginger, alcohol (90%), and syrup.	1 in 40.

The syrups are recognised by their colour, with which the student should be familiar. Syrup, syrup of orange flowers,

chloral, iodide and phosphate of iron, lactophosphate of lime, codeine, and tolu are *colourless*. Syrups of squill, lemon, orange, and ginger and aromatic syrup are straw-coloured; the last three being somewhat muddy. Syrups of rhubarb, prune, and hemidesmus are brown, whilst syrup of senna is a dark coffee-brown. Syrups of red poppy and red rose are of brilliant shades of red.

Tabellæ (Tablets—only one preparation is official).

Tabellæ Trinitrini—Tablets of chocolate, each weighing 5 grs., and containing $\frac{1}{100}$ gr. of trinitroglycerin of commerce.

Tincturæ (Tinctures—67 in number) are alcoholic solutions, chiefly of vegetable substances, though two are from the animal kingdom—viz., cochineal and cantharides. Two are from the inorganic world—viz., perchloride of iron and iodine, the remaining 63 being of vegetable origin.

One pint is the quantity ordered in all the tinctures with two exceptions—viz., Belladonna (30 ounces) and Nux Vomica (12 ounces).

The B.P. process of *percolation* for tinctures, as given in an Appendix, is briefly:—Moisten the solids with a small quantity of the menstruum, and set aside in a closed vessel for 24 hours. Pack in a percolator, and percolate with the menstruum added gradually until about $\frac{3}{4}$ of the amount of tincture is obtained. Press the marc removed from the percolator, and filter the expressed liquid, mix it with the percolate, and make up to the required product with the menstruum.

In the *maceration* process the solid ingredients are placed in the whole of the menstruum in a closed vessel for 7 days, frequently agitating. Strain, press the marc. Mix the liquids, and filter if necessary.

25 are made by simple maceration.

29 are made by percolation.

13 are made by simple solution or mixing.

Alcohol of various strengths is used in making 65 of the tinctures—Alcohol (90 per cent.) in 20, alcohol (70 per cent.) in 14, alcohol (60 per cent.) in 21, alcohol (45 per cent.) in 10, whilst water, in addition, is used in 6 tinctures.

1 is made with spirit of ether (Ethereal Tincture of Lobelia).

1 with tincture of orange (Tincture of Quinine).

49 tinctures consist of one ingredient and the solvent—"Simple Tinctures."

9 tinctures are called compound—"Compound Tinctures" (see p. 169).

TINCTURA.	INGREDIENTS.	STRENGTH.	DOSE.
Aconiti ..	Root, alcohol (70%).	1 in 20.	5 to 15 or 2 to 5 m.
Arnicae ..	Rhizome, " (70%).	1 in 20.	—
Asafetidae ..	Gum, " (70%).	1 in 5.	$\frac{1}{2}$ to 1 dr.
Aurantii ..	Fresh peel, " (90%).	1 in 4.	$\frac{1}{2}$ to 1 dr.
Belladonnæ ..	Liquid extract, " (60%).	1 in 15 ('048 to '052% alkaloids).	5 to 15 m.
Buchu ..	Leaves, " (60%).	1 in 5.	$\frac{1}{2}$ to 1 dr.
Calumbæ ..	Root, " (60%).	1 in 10.	$\frac{1}{2}$ to 1 dr.
Cannab. Ind. ..	Extract, " (90%).	1 in 20.	5 to 15 m.
Cantharidis ..	Flies, " (90%).	1 in 80.	5 to 15 or 2 to 5 m.
Capsici ..	Fruit, " (70%).	1 in 20.	5 to 15 m.
Cascarillæ ..	Bark, " (70%).	1 in 5.	$\frac{1}{2}$ to 1 dr.
Chiratae ..	Herb, " (60%).	1 in 10.	$\frac{1}{2}$ to 1 dr.
Cimicifugæ ..	Rhizome, " (60%).	1 in 10.	$\frac{1}{2}$ to 1 dr.
Cinchonæ ..	Red bark, " (70%).	1% alkaloids.	$\frac{1}{2}$ to 1 dr.
Cinnamomi ..	Bark, " (70%).	1 in 5.	$\frac{1}{2}$ to 1 dr.
Cocci ..	Insects, " (45%).	1 in 10.	5 to 15 m.
Colchici Sem. ...	Seeds, " (45%).	1 in 5.	5 to 15 m.
Conii ..	Fruit, " (70%).	1 in 5.	$\frac{1}{2}$ to 1 dr.
Croci ..	Stigmas, " (60%).	1 in 20.	5 to 15 m.
Cubebæ ..	Fruit, " (90%).	1 in 5.	$\frac{1}{2}$ to 1 dr.
Digitalis ..	Leaves, " (60%).	1 in 8.	5 to 15 m.
Ferri Perchlor.	Strong liquor, water, and " (90%).	1 in 4.	5 to 15 m.
Gelsemii ..	Root, " (60%).	1 in 10.	5 to 15 m.
Hamamelidis	Bark, " (45%).	1 in 10.	$\frac{1}{2}$ to 1 dr.
Hydrastis ..	Rhizome, " (60%).	1 in 10.	$\frac{1}{2}$ to 1 dr.
Hyoscyami ..	Leaves, " (45%).	1 in 10.	$\frac{1}{2}$ to 1 dr.
Jaborandi ..	Leaves, " (45%).	1 in 5.	$\frac{1}{2}$ to 1 dr.
Jalapæ ..	Root, " (70%).	1'5% resin.	$\frac{1}{2}$ to 1 dr.
Krameria ..	Root, " (60%).	1 in 5.	$\frac{1}{2}$ to 1 dr.
Limonis ..	Fresh peel, " (90%).	1 in 4.	$\frac{1}{2}$ to 1 dr.
Lobeliae Æth.	Herb, spirit of ether.	1 in 5.	5 to 15 m.
Lupuli ..	Strobiles, alcohol (60%).	1 in 5.	$\frac{1}{2}$ to 1 dr.
Myrrhæ ..	Gum resin, " (90%).	1 in 5.	$\frac{1}{2}$ to 1 dr.
Nuc. Vomica	Liquid extract, water, " (90%).	'24 to '26% strychnine.	5 to 15 m.
Opii ..	Opium, water, " (90%).	'7 to '8% morphine.	5 to 15 or 20 to 30 m.
Podophylli ..	Resin, " (90%).	2 grs. in 1 dr.	5 to 15 m.
Pruni Virg. ..	Bark, water, " (90%).	1 in 5.	$\frac{1}{2}$ to 1 dr.
Pyrethri ..	Root, " (70%).	1 in 5.	Not taken.
Quassia ..	Chips, " (45%).	1 in 10.	$\frac{1}{2}$ to 1 dr.
Quillaiæ ..	Bark, " (60%).	1 in 20.	$\frac{1}{2}$ to 1 dr.
Quininæ ..	Quinine hydrochlor., tinct. of orange.	1 in 50.	$\frac{1}{2}$ to 1 dr.
Scillæ ..	Bulb, alcohol (60%).	1 in 5.	5 to 15 m.
Senegæ ..	Root, " (60%).	1 in 5.	$\frac{1}{2}$ to 1 dr.
Serpentariæ ..	Rhizome, " (70%).	1 in 5.	$\frac{1}{2}$ to 1 dr.
Stramonii ..	Leaves, " (45%).	1 in 5.	5 to 15 m.
Strophanthi ..	Seeds, " (70%).	1 in 40.	5 to 15 m.
Sumbul ..	Root, " (70%).	1 in 10.	$\frac{1}{2}$ to 1 dr.
Tolutana ..	Balsam, " (90%).	1 in 10.	$\frac{1}{2}$ to 1 dr.
Zingiberis ..	Rhizome, " (90%).	1 in 10.	$\frac{1}{2}$ to 1 dr.

TINCTURA.	INGREDIENTS.	STRENGTH.	DOSE.
Aloes	Extract of Barbados aloes, liquid extract of liquorice, alcohol (45%).	1 in 40.	$\frac{1}{2}$ to 1 dr. or 1 $\frac{1}{2}$ to 2 drs.
Catechu ..	Catechu, cinnamon, alcohol (60%).	1 in 5.	$\frac{1}{2}$ to 1 dr.
Ergotæ Ammon.	Ergot, solution of ammonia, alcohol (60%).	1 in 4.	$\frac{1}{2}$ to 1 dr.
Guaiaci Ammon.	Resin, oil of nutmeg, oil of lemon, strong solution of ammonia, alcohol (90%).	1 in 5.	$\frac{1}{2}$ to 1 dr.
Iodi	Iodine, potassium iodide, water, and alcohol (90%).	1 in 40.	2 to 5 mins.
Kino	Gum kino, glycerin, water, and alcohol (90%).	1 in 10.	$\frac{1}{2}$ to 1 dr.
Opii Ammon. .. (Scotch Paregoric.)	Tincture of opium, benzoic acid, oil of anise, strong solution of ammonia, alcohol (90%).	5 grs. opium in 1 oz.	$\frac{1}{2}$ to 1 dr.
Quininæ Am. ..	Quinine sulphate, solution of ammonia, alcohol (60%).	1 in 50.	$\frac{1}{2}$ to 1 dr.
Valerianæ Ammon.	Rhizome, oil of nutmeg, oil of lemon, solution of ammonia, and alcohol (60%).	1 in 5.	$\frac{1}{2}$ to 1 dr.

COMPOUND TINCTURES.

TINCTURA.	INGREDIENTS.	STRENGTH.	DOSE.
Benzoini Co. .. (Friar's Balsam.)	Benzoin, storax, tolu, socotrine aloes, alcohol (90%).	1 in 10.	$\frac{1}{2}$ to 1 dr.
Camphoræ Co. (Paregoric.)	Tincture of opium, benzoic acid, camphor, oil of anise, alcohol (60%).	2 grs. opium in 1 oz.	$\frac{1}{2}$ to 1 dr.
Cardamomi Co.	Seeds, caraway, raisins, cinnamon, cochineal, alcohol (60%).	1 in 80.	$\frac{1}{2}$ to 1 dr.
Chloroformi et Morphinæ Co.	Chloroform, morphine hydrochloride, diluted hydrocyanic acid, tincture of capsicum, tincture of Indian hemp, oil of peppermint, glycerin, alcohol (90%).	$\frac{1}{4}$ min. and $\frac{1}{11}$ gr. in 10 mins.	5 to 15 min.
Cinchonæ Co.	Tincture of cinchona, orange peel, serpentary, saffron, cochineal, alcohol (70%).	45 to 55% alkaloids.	$\frac{1}{2}$ to 1 dr.
Gentianæ Co.	Root, orange peel, cardamoms, alcohol (45%).	1 in 10.	$\frac{1}{2}$ to 1 dr.
Lavandulæ Co.	Oil of lavender, oil of rosemary, cinnamon, nutmeg, red sanders wood, alcohol (90%).	1 in 213.	$\frac{1}{2}$ to 1 dr.
Rhei Co. ..	Root, coriander fruit, cardamoms, glycerin, and alcohol (60%).	1 in 10.	$\frac{1}{2}$ to 1 dr. or 2 to 4 drs.
Sennæ Co. ..	Leaves, raisins, caraway, coriander and alcohol (45%).	1 in 5.	$\frac{1}{2}$ to 1 dr. or 2 to 4 drs.

9 tinctures, though not *called* compound, contain more than one ingredient and the solvent—"Complex Tinctures" (see p. 169).

7—Belladonna, Compound Camphor, Cinchona, Compound Cinchona, Nux Vomica, Opium, and Ammoniated Opium—have a definite alkaloidal strength, and Tincture of Jalap is made to contain $1\frac{1}{2}$ per cent. resin. Only 1—Digitalis—has a strength of 1 in 8, and 1—Belladonna—of 1 in 15. Belladonna and Nux Vomica are prepared from their liquid extracts; Camph. Co. and Opii Ammon. from Tinct. Opii; and Cinchonæ Co. from Tinct. Cinchonæ.

The dosage of 6 tinctures—Aconiti, Aloes, Cantharidis, Opii, Rhei Co., and Sennæ Co.—is given both for a single dose and for repeated administration.

LOZENGES.

TROCHISCUS.	INGREDIENTS.	STRENGTH OF EACH.
Acidi Benzoici ..	Benzoic acid, fruit basis.	$\frac{1}{2}$ gr.
Acidi Carbolic ..	Phenol, tolu basis.	1 gr.
Acidi Tannici ..	Tannin, fruit basis.	$\frac{1}{2}$ gr.
Bismuthi Compositus	Bismuth oxycarbonate,	2 grs.
	Magnesium carbonate,	2 grs.
	Precipitated calcium carbonate,	4 grs.
	Rose basis.	
Catechu	Catechu, simple basis.	1 gr.
Eucalypti Gummi	Eucalyptus gum, fruit basis.	1 gr.
Ferri Redacti ..	Reduced iron, simple basis.	1 gr.
Guaiaci Resinæ ..	Guaiacum resin, fruit basis.	3 grs.
Ipecacuanhæ ..	Ipecacuanha, fruit basis.	$\frac{1}{4}$ gr.
Krameria ..	Extract of krameria, fruit basis.	1 gr.
Krameria et Cocainæ	Extract of krameria,	1 gr.
	Cocaine hydrochloride,	$\frac{1}{20}$ gr.
	Fruit basis.	
Morphinæ ..	Morphine hydrochloride, tolu basis.	$\frac{1}{36}$ gr.
Morphinæ et Ipecac.	Ditto, with the addition of ipecacuan.	$\frac{1}{36}$ and $\frac{1}{12}$ gr.
Potassii Chloratis	Potassium chlorate, rose basis.	3 grs.
Santonini	Santonin, simple basis.	1 gr.
Sodii Bicarbonatis	Sodium bicarbonate, rose basis.	3 grs.
Sulphuris	Precipitated sulphur, cream of tartar, sugar, gum acacia, mucilage and tincture of orange.	5 grs.

Trochisci (Lozenges—17 in number) are small tablets, composed of a basis, blended with a medicinal substance. The 4 bases ordered are—Fruit, Rose, Simple, and Tolu, the directions for preparation of each being given at length in an Appendix to the Pharmacopœia. Briefly, *Simple* basis consists

of sugar, gum acacia, mucilage of gum acacia, and water. For *Rose* basis, rose water, instead of distilled water, is used ; whilst for *Tolu* and *Fruit* basis, tincture of tolu and black currant paste of commerce are used respectively in addition to the other four materials.

OINTMENTS

(EXCLUSIVE OF THE MERCURIAL ONES).

UNGUENTUM.	COMPOSITION.	STRENGTH.
Acidi Borici ..	Boric acid, paraffin ointment.	1 in 10.
Acidi Carbolic ..	Phenol, glycerin, paraffin ointment.	1 in 25.
Acidi Salicylici ..	Salicylic acid, paraffin ointment.	1 in 50.
Aconitinæ ..	Aconitine, oleic acid, lard.	1 in 50.
Aquæ Rosæ ..	Rose water, white beeswax, spermaceti, almond oil, oil of rose.	7 in 19.
Atropinæ ..	Atropine, oleic acid, and lard.	1 in 50.
Belladonnæ ..	Liquid extract (evaporated) and benzoated lard.	6% alkaloids.
Cantharidis ..	Cantharides, benzoated lard.	1 in 10.
Capsici ..	Capsicum fruit, spermaceti, olive oil.	1 in 4½.
Cetacei ..	Spermaceti, white beeswax, almond oil, and benzoin.	1 in 5.
Chrysarobini ..	Chrysarobin and benzoated lard.	1 in 25.
Cocainæ ..	Cocaine, oleic acid, lard.	1 in 25.
Conii ..	Juice of hemlock, hydrous wool fat.	2 in 1.
Creosoti ..	Creosote, hard and soft (white) paraffins.	1 in 10.
Eucalypti ..	Oil of eucalyptus, soft (white) and hard paraffins.	1 in 10.
Gallæ ..	Galls and benzoated lard.	1 in 5.
Gallæ cum Opio ..	Gall ointment and opium.	7½%
Glycerini Plumbi Subacetatis	Glycerin of lead subacetate, paraffin ointment.	1 in 6.
Hamamelidis ..	Liquid extract and hydrous wool fat.	1 in 10.
Iodi ..	Iodine, potassium iodide, glycerin, lard.	1 in 25.
Iodoformi ..	Iodoform and paraffin ointment.	1 in 10.
Paraffini ..	Hard paraffin, soft paraffin (white or yellow).	3 and 7 in 10.
Picis Liquidæ ..	Tar and yellow beeswax.	5 in 7.
Plumbi Acetatis ..	Lead acetate and paraffin ointment.	1 in 25.
Plumbi Carbonatis	Lead carbonate and paraffin ointment.	1 in 10.
Plumbi Iodidi ..	Lead iodide and paraffin ointment.	1 in 10.
Potassii Iodidi ..	Potassium iodide and carbonate, water, and benzoated lard.	1 in 10.
Resinæ ..	Resin, yellow beeswax, olive oil, and lard.	1 in 3¾.
Staphisagriæ ..	Stavesacre seeds, yellow beeswax, and benzoated lard.	1 in 5.
Sulphuris ..	Sublimed sulphur, benzoated lard.	1 in 10.
Sulphuris Iodidi ..	Sulphur iodide, glycerin, benzoated lard.	1 in 25.
Veratrinæ ..	Veratrine, oleic acid, lard.	1 in 50.
Zinci ..	Zinc oxide and benzoated lard.	3 in 20.
Zinci Oleatis ..	Zinc oleate, prepared with zinc sulphate, hard soap, and water, mixed with soft paraffin.	1 in 2.

Unguenta (Ointments—44 in number) are mixtures for external application of medicinal substances with lard, paraffin,

lanoline or wax and oil, of the consistence of butter ; 2i contain lard in some form. White, in preference to yellow soft paraffin, is to be employed in making white ointments. The 10 ointments of mercury require separate notice.

OINTMENTS OF MERCURY.

UNGUENTUM.	COMPOSITION.	STRENGTH.
Hydrargyri	Mercury, lard, suet.	1 in 2.
Hydrg. Ammoniat	Ammoniated mercury, paraffin ointment.	1 in 10.
Hydrarg. Comp.	Mercury ointment, olive oil, yellow beeswax, camphor.	1 in 5 (of Hg.).
Hydrg. Iodidi Rubri	Red iodide, benzoated lard.	1 in 25.
Hydrg. Nitratis ..	Mercury, nitric acid, lard, olive oil.	1 in 15 (of Hg.).
Hydrg. Nitratis Dil.	Mercuric nitrate ointment, soft paraffin (yellow).	1 in 5.
Hydrg. Oleatis ..	Mercuric oleate, benzoated lard.	1 in 4.
Hydrg. Oxidi Flavi	Yellow mercuric oxide, soft paraffin (yellow).	1 in 50.
Hydrg. Oxidi Rubri	Red mercuric oxide, paraffin ointment (yellow).	1 in 10.
Hydrg. Subchloridi	Mercurous chloride, benzoated lard.	1 in 10.

Vina (Wines—of which there are 8 in number) are simply tinctures made with sherry or orange wine instead of alcohol.

WINES.

VINUM.	COMPOSITION.	STRENGTH.	DOSE.
Antimoniale ..	Tartar emetic, boiling water, and sherry.	2 grs. in 1 oz.	10 to 30 m. ; 2 to 4 drs. as emetic.
Aurantii ..	(Used for citrate of iron and quinine wines.)	10 to 12% [alcohol.]	—
Colchici ..	Dried corn and sherry.	1 in 5.	10 to 30 m.
Ferri	1 oz. iron wire and 1 pint sherry.	Variable.	1 to 4 drs.
Ferri Citratis ..	Iron and ammonium citrate, orange wine.	1 gr. in 1 dr.	1 to 4 drs.
Ipecacuanhæ	Liquid extract of ipecacuanha and sherry.	1 in 20.	10 to 30 m. as ex- pectorant ; 4 to 6 drs. as emetic.
Quininæ ..	Quinine hydrochloride and orange wine.	1 gr. to 1 oz.	½ to 1 oz.
Xericum ..	(A Spanish wine.)	16% [alcohol.]	—

The student should be familiar with the following groups of important vegetable substances represented in the B.P. :—

Alkaloids.—The following are a few of the distinguishing characters of this group of active nitrogenous principles or organic bases. They all contain nitrogen ; they turn red litmus blue ; they may be regarded as compound ammonias ; they combine with acids to form salts easily soluble as a rule in water, though they themselves are generally insoluble in water. The following are the pure alkaloids of the B.P. :—

Aconitine,	Codeine,
Atropine,	Strychnine,
Caffeine,	Veratrine.
Cocaine,	

The following salts of alkaloids are contained in the B.P. :—

Apomorphine Hydrochloride,	Morphine Tartrate,
Atropine Sulphate,	Morphine Acetate,
Caffeine Citrate,	Morphine Hydrochloride,
Cocaine Hydrochloride,	Physostigmine Sulphate,
Codeine Phosphate,	Quinine Hydrochloride,
Homatropine Hydrobromide,	Quinine Acid Hydrochloride,
Hyoscine Hydrobromide,	Quinine Sulphate,
Hyoscyamine Sulphate,	Strychnine Hydrochloride.

Neutral Principles are bodies closely resembling the alkaloids in action and of complicated chemical constitution. Such are Chrysarobin, Elaterin, Salicin, Santonin, and Picrotoxin. (Chrysarobin is not a *pure* principle.)

Glucosides.—Some of the above neutral principles under the action of ferments and acids split up into glucose, alcohols, etc. ; these are known as Glucosides, as Picrotoxin, Santonin, Salicin, and Tannic Acid or Tannin.

The student should note the terminology of these bodies. The English names of the alkaloids end in *ine*, and the Latin in *ina*, whilst the neutral principles and glucosides end in *in*, and the Latin in *inum*. (Lupulin, Ergotin, and Euonymin do not belong to these groups.)

Gums are complex viscid bodies obtained by exudation from the stems, or stems and branches of plants. They contain arabin, or bassorin, or both. The B.P. representatives are Acacia and Tragacanth. (Eucalyptus and Kino are not true gums.)

Resins are solid, brittle, non-volatile, complex bodies, generally resulting from the oxidation of volatile hydrocarbons ; they are insoluble in water and soluble in alkalies and spirit.

The B.P. representatives are Guaiacum, Jalap, Scammony, and Podophyllum Resins.

Burgundy Pitch and common Resin are generally included in the list of resins.

Gum-Resins are exudations containing variable proportions of gums, resins, and volatile oils. They form emulsions when rubbed up with water, the soluble viscid gum forming a solution which keeps the resinous and oily particles in suspension.

The B.P. representatives are Ammoniacum, Asafetida, Galbanum, Gamboge, Myrrh, and Scammony.

Oleo-Resins are complex bodies consisting of various proportions of resins and volatile oils. The following drugs are true Oleo-resins :—Copaiba, Canada Turpentine, and Frankincense.

Balsams are resinous or oleo-resinous bodies containing either benzoic or cinnamic acid or both. Those contained in the B.P. are Peruvian and Tolu Balsams, Benzoin and Prepared Storax.

Neither of the so-called Canada and Copaiba Balsams belongs to this group.

Stearoptenes are crystalline oxidised hydrocarbons, or solid volatile oils, as Camphor, Menthol, and Thymol.

OFFICIAL REMEDIES.

ACACIÆ GUMMI (Gum Acacia)—Leguminosæ.

Gum Arabic ; an exudation from the stem and branches of *Acacia Senegal*, and other species, in spheroidal, colourless tears, or in angular, glistening, colourless or yellowish fragments. Consists chiefly of Arabic Acid or Arabin.

Demulcent. Used to suspend insoluble powders in mixtures.

Gum Acacia enters into Compound Almond, and Tragacanth Powders, Phosphorus Pill, the Lozenge Bases, and the following :—

Mucilago Acaciæ, 4 and 6.

An almost colourless, translucent, viscid liquid ; prepared by dissolving 4 ozs. gum acacia, after rinsing with water, in 6 ozs. cold distilled water.

Enters into the Lozenge Bases, and into Mist. Ol. Ricini.

ACETANILIDUM (Acetanilide), $\text{CH}_3\text{CONHC}_6\text{H}_5$.

(Synonym—Phenyl-Acetamide.)

Commonly known as Antifebrin. Colourless, glistening, scaly crystals obtainable by acting on aniline by glacial acetic acid.

Antipyretic and Analgesic. Dose—1 to 3 grs.

ACIDUM ACETICUM (Acetic Acid), CH_3COOH .

A colourless acid liquid, with a pungent odour, prepared from wood by destructive distillation, and by oxidation of ethylic alcohol, and containing 33 per cent. of hydrogen acetate.

Counter-irritant, Vesicant, and Caustic.

The following preparations contain free acetic acid :—

Acetum Cantharidis ; Acetum Ipecac. ; Acetum Scillæ ; Acid. Aceticum ; Acid. Aceticum Dilutum ; Acid. Aceticum Glaciale ; Liniment. Terebinth. Acet. ; Liquor Morphinæ Acetatis ; Oxy-mel ; Oxy-mel Scillæ ; Sympus Scillæ.

Acidum Aceticum Dilutum, 1 in 8.

A colourless liquid, prepared by mixing acetic acid $2\frac{1}{2}$ ozs. and sufficient distilled water to make 1 pint. Contains 4.27 per cent. of hydrogen acetate.

Refrigerant and Diuretic. Dose— $\frac{1}{2}$ to 2 drs.

IN—Acetum Scillæ, Acetum Ipecac., and Liquor Morphinæ Acetatis.

Acidum Aceticum Glaciale (Glacial Acetic Acid).

Concentrated acetic acid—a colourless fluid, crystallising when cooled, and containing 99 per cent. of hydrogen acetate. Powerfully caustic.

IN—Acetum Cantharidis, Lin. Tereb. Acet., and Liq. Ferri Acet.

The following are the percentages of real acetic acid found in : Acetic Acid, 33.0 : Dilute Acetic Acid, 4.27 ; Glacial Acetic Acid, 99.

ACIDUM ARSENIOSUM (Arsenious Anhydride), As_2O_3 .

(Synonyms—Arsenic ; White Arsenic ; Arsenious Acid.)

An anhydride (not a true acid), occurring as a heavy white powder or in sublimed vitreous masses, obtained by roasting arsenical ores. It is also known as arsenious oxide.

Alterative, Tonic, and Caustic. Dose— $\frac{1}{60}$ to $\frac{1}{15}$ gr.

Liquor Arsenicalis, 1 gr. in 110 mins. (1 per cent.). (Synonyms—Liquor Potassæ Arsenitis ; Fowler's Solution.)

A pinkish liquid, composed of arsenious anhydride in powder, and potassium carbonate, of each $87\frac{1}{2}$ grs., compound tincture of lavender 5 drs., distilled water to 1 pint.

Dose—2 to 8 mins.

This is the most frequently used preparation of arsenic ; and, like all the preparations of the drug, should be commenced in small doses and gradually increased. A good rule is to begin in adults with 2 minims and gradually increase to 8 or more—always after meals, and freely diluted. Children bear as large doses as adults.

Liquor Arsenici Hydrochloricus, 1 gr. in 110 mins. (1 per cent.).

A colourless liquid prepared by dissolving arsenious anhydride $87\frac{1}{2}$ grs. in hydrochloric acid 2 drs., and distilled water to 1 pint. (This is three times the strength of De Valangin's Solvent.)

Dose—2 to 8 mins. freely diluted.

Arsenii Iodidum (Arsenious Iodide), AsI_3 .

Small orange crystals obtained by direct combination of iodine and arsenium.

Alterative and Tonic. Dose— $\frac{1}{20}$ to $\frac{1}{5}$ gr.

Liquor Arsenii et Hydrargyri Iodidi, 1 gr. in 110 mins. (1 per cent.).

A clear pale yellow liquid, prepared by dissolving $87\frac{1}{2}$ grs. of arsenious iodide and $87\frac{1}{2}$ grs. of mercuric iodide in distilled water to 1 pint.

Known as Donovan's Solution.

Alterative and Antisyphilitic. Dose—5 to 20 mins.

Ferri Arsenas (Ferrous Arsenate, $\text{Fe}_3(\text{AsO}_4)_2 \cdot 6\text{H}_2\text{O}$, with Ferric Arsenate and some Iron Oxide). (Arseniate of Iron B.P. 85.)

A tasteless, amorphous, greenish powder, insoluble in water, but readily soluble in hydrochloric acid. Prepared by mixing solutions of sodium arsenate and bicarbonate with one of ferrous sulphate, filtering and drying at a low temperature.

Alterative like Arsenic. Dose— $\frac{1}{16}$ to $\frac{1}{4}$ gr., in pill.

Sodii Arsenas, Na_2HAsO_4 (Sodium Arsenate).

(Arseniate of Sodium, hydrous, B.P. 85.)

A soluble white powder obtained by exposing to 300°F . crystallised sodium arsenate, which may be prepared by treating with water the product of the fusion of arsenious anhydride, sodium nitrate, and sodium carbonate.

Dose— $\frac{1}{40}$ to $\frac{1}{10}$ gr., in pill or in mixture.

Liquor Sodii Arsenatis, 1 gr. in 110 mins. (1 per cent.).

A colourless solution of *anhydrous* sodium arsenate, $17\frac{1}{2}$ grs. in distilled water to 4 ozs. (Pearson's Solution is 1 in 600.)

Dose—2 to 8 mins., diluted, after food.

ACIDUM BENZOICUM (Benzoic Acid), $\text{C}_6\text{H}_5\text{COOH}$.

A crystalline acid, obtained from benzoin by sublimation. It is also obtained from toluene, from hippuric acid, and from other organic compounds. In light feathery plates and needles, nearly colourless, and odourless when quite pure, but when obtained from benzoin has an aromatic odour.

Antiseptic, Expectorant, and Diuretic. Dose—5 to 15 grs.

IN—Benzoates of Sodium and Ammonium, Tr. Camph. Co., and Tr. Opii Ammon.

Trochiscus Acidi Benzoici, $\frac{1}{2}$ gr. in each.

Composed of benzoic acid and fruit basis.

ACIDUM BORICUM (Boric Acid), H_3BO_3 .

(Synonyms—Boracic Acid ; Hydrogen Borate.) Colourless, pearly, lamellar crystals, obtained by the action of sulphuric acid on borax, or from native boric acid. Dose—5 to 15 grs.

Antiseptic and Diuretic.

Glycerinum Acidi Borici, 6 in 16 (by vol.).

Boric Acid 6 ozs. added to 9 ozs. (by weight) glycerin, and heated to 302°F . When dissolved, maintain at this temperature till it weighs 10 ozs., then add 10 ozs. (by weight) glycerin.

Unguentum Acidi Borici, 1 in 10.

A white or faintly yellow ointment, prepared by mixing sifted boric acid 1 oz. with 9 ozs. paraffin ointment (white).

Antiseptic.

ACIDUM CARBOLICUM (Phenol), C_6H_5OH .

An acid obtained by the fractional distillation of coal-tar oil. In colourless acicular crystals, which become an oily liquid like creosote, at at least $102^{\circ} F$.

Antiseptic and Escharotic. Dose—1 to 3 grs., in pill.

Commonly called Carbolic Acid.

Enters into *Injectio Ergotæ Hypoderm.* and *Liquor Thyroidei*.

Acidum Carbolicum Liquefactum (Liquefied phenol), 90.9 per cent.

A colourless liquid, usually changing to pink, prepared by the addition of 10 per cent. of water to phenol liquefied by heat.

Dose—1 to 3 minims, largely diluted.

Glycerinum Acidi Carbolici, 1 in 5 (1 in $6\frac{1}{4}$ by weight).

A thick, colourless liquid, prepared by dissolving phenol 1 oz. in glycerin to 5 fl. ozs. One fluid drachm contains 12 grs.

Suppositoria Acidi Carbolici, 1 gr. in each.

Phenol 12 grs.; white beeswax 24 grs.; oil of theobroma, q.s. Divided into 12 small conical masses.

Antiseptic and Local Anæsthetic.

Trochiscus Acidi Carbolici, 1 gr. in each.

Each lozenge contains phenol 1 gr. with tolu basis.

Unguentum Acidi Carbolici, 1 in 25.

Phenol $\frac{1}{2}$ oz.; paraffin ointment (white) $10\frac{1}{2}$ ozs.; glycerin $1\frac{1}{2}$ ozs.

Antiseptic and Deodorant.

ACIDUM CHROMICUM (Chromic Anhydride), CrO_3 .

(Commonly called Chromic Acid.)

In crimson acicular crystals, prepared by interaction of potassium bichromate and sulphuric acid.

Caustic.

Liquor Acidi Chromici, 1 in 4, or $29\frac{1}{2}$ per cent. real acid, H_2CrO_4 .

An orange-red, inodorous acid liquid, prepared by dissolving 1 oz. chromic anhydride in 3 ozs. distilled water.

Caustic.

ACIDUM CITRICUM (Citric Acid), $C_3H_4OH(COOH)_3, H_2O$.

An acid, in colourless rhombic crystals, obtained from the juice of the fruit of various species of *Citrus*.

Refrigerant. Dose—5 to 20 grs. in water.

17 grs. dissolved in half an oz. of water are equivalent to one tablespoonful of fresh lemon-juice, and will saturate in an effervescing mixture :

24½ grs. bicarbonate of potassium in 1 oz. water.

20 grs. carbonate of potassium in 1 oz. water.

35 grs. carbonate of sodium in 1 oz. water.

20½ grs. bicarbonate of sodium in 1 oz. water.

13 grs. carbonate of ammonium in 1 oz. water.

Succus Limonis, *Syr. Limonis*, *Sodii Phosp. Efferves.*, *Sodii Sulph. Efferves.*, *Mag. Sulph. Efferves.*, *Lithii Citras Efferves.*, contain free citric acid.

ACIDUM GALLICUM (Gallic Acid), $C_6H_2(OH)_3COOH, H_2O$.

An acid in yellowish-white, satiny needles, prepared by the action of dilute sulphuric acid on tannic acid. Soluble in 100 parts of cold water.

Astringent. Used in internal hæmorrhages.

Dose—5 to 15 grs. in solution, in pills or in powder.

Preparations containing gallic or tannic acids should not be combined with any preparation containing iron.

ACIDUM HYDROBROMICUM DILUTUM, 1 in 10.

A colourless aqueous solution, containing 10 per cent. of hydrogen bromide, HBr ., prepared by distilling potassium bromide with concentrated phosphoric acid.

Hypnotic and Sedative, like KBr . Dose—15 to 60 mins.

ACIDUM HYDROCHLORICUM (Hydrochloric Acid).

Hydrogen chloride gas (HCl), produced by interaction of H_2SO_4 and $NaCl$, dissolved in water, and forming 31.79 per cent. of the solution, which is nearly colourless and strongly acid, emitting white pungent fumes.

Caustic—not used internally in this form.

IN—Acid. Nitro-Hydrochlor. Dil. ; *Liq. Arsenici Hydrochlor.* ; *Glycerinum Pepsini*, and the following :—

Acidum Hydrochloricum Dilutum, 1 in 3.3. (10.58 per cent. Hydrogen Chloride.)

A colourless mixture of hydrochloric acid and distilled water.

Dose—5 to 20 mins., in water.

IN—*Liq. Morph. Hydrochlor.* and *Inj. Apomorph. Hypoderm.* Used in making *Ext. Ergotæ*.

ACIDUM HYDROCYANICUM DILUTUM, 1 in 50 (Diluted Hydrocyanic Acid), HCN .

Hydrogen Cyanide, dissolved in water, and forming 2 per cent. of the solution; prepared by interaction of potassium ferrocyanide and diluted sulphuric acid. It is a colourless liquid with a peculiar odour. Known as Dilute Prussic Acid.

Should be stored in a dark place, in small inverted stoppered bottles of amber-coloured glass, the stoppers being tied over with impervious tissue.

Sedative—a deadly poison. Dose—2 to 6 mins., in water.

Scheele's Prussic Acid is $2\frac{1}{2}$ times stronger than the above.

IN—Tinct. Chlorof. et Morph. Co. 1 in 20, and Aq. Laurocerasi 1% of real acid.

ACIDUM LACTICUM (Lactic Acid), $\text{CH}_3\text{CHOHCOOH}$.

A colourless syrupy liquid, consisting of hydrogen lactate and 25 per cent. of water, prepared by the action of a special ferment on lactose.

A solvent of false membranes. Used in preparing Syrupus Calcii Lactophosphatis.

ACIDUM NITRICUM (Nitric Acid), HNO_3 .

An acid prepared by interaction of potassium nitrate or sodium nitrate and sulphuric acid, and containing 70 per cent. by weight of real HNO_3 . A colourless heavy liquid, emitting an acid, corrosive vapour.

Corrosive—Not used internally in this form.

IN—Liq. Ferri Pernit., Liq. Hydrarg. Nit. Acidus, Ungt. Hyd. Nit., and

Acidum Nitricum Dilutum, 1 in $5\frac{1}{8}$.

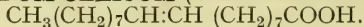
A colourless mixture of 3 ozs. and 7 drs. nitric acid and distilled water to make 1 pint—corresponding to 17.44 per cent. real acid.

Tonic and Astringent. Dose—5 to 20 mins.

Acidum Nitro-Hydrochloricum Dilutum, $\frac{3}{4}$ and 1 in 8.

Nitric Acid, 3 ozs.; hydrochloric acid, 4 ozs.; distilled water, 25 ozs., making a colourless liquid, which should be kept in a stoppered bottle 14 days before being used. It contains free chlorine, hydrochloric, nitric and nitrous acids.

Dose—5 to 20 mins., freely diluted.

ACIDUM OLEICUM (Oleic Acid or Hydrogen Oleate),

A straw-coloured liquid, nearly odourless and tasteless, obtained by the saponifying action of alkalies and subsequent

action of acids, or by the action of superheated steam, upon the olein of fats. Usually not quite pure.

Used in making Mercuric Oleate and Ointments of Aconitine, Atropine, Cocaine, and Veratrine.

ACIDUM PHOSPHORICUM CONCENTRATUM (Concentrated Phosphoric Acid), 66·3 per cent., H_3PO_4 .

A colourless syrupy liquid, consisting of hydrogen orthophosphate with 33·7 per cent. of water, obtained by treating the product of burning phosphorus in air with water and nitric acid.

Externally, Caustic. Internally, Tonic.

IN—Syrups of Calcium Lactophosphate, of Ferrous Phosphate, and of Phosphate of Iron with Quinine and Strychnine; in preparation of Dilute Hydrobromic Acid; and

Acidum Phosphoricum Dilutum, 3 in 20. (13·8 per cent. H_3PO_4 .)

A colourless liquid, prepared by mixing 3 fl. ozs. concentrated phosphoric acid with q.s. distilled water to measure 1 pint.

Tonic and Refrigerant. Dose—5 to 20 mins.

ACIDUM SALICYLICUM (Salicylic Acid), $\text{C}_6\text{H}_4\text{OHCOOH}$.

An acid in distinct, prismatic, colourless crystals, obtained from natural salicylates, as oils of wintergreen (*Gaultheria procumbens*) and sweet-birch (*Betula lenta*), or by the interaction of sodium carbolate and carbonic anhydride.

Antipyretic and Antirheumatic. Dose—5 to 20 grs.

Enters into *Injectio Cocainæ Hypodermica* and *Liq. Atropin. Sulph.*

Unguentum Acidi Salicylici, 1 in 50.

A white ointment, prepared by mixing 10 grs. salicylic acid and 490 grs. white paraffin ointment.

Antiseptic.

Sodii Salicylas ($\text{C}_6\text{H}_4\text{OH}, \text{COONa})_2\text{H}_2\text{O}$.

Small colourless crystalline scales or in tabular crystals of pearly lustre if prepared from natural acid, obtained by interaction of salicylic acid and sodium carbonate or sodium hydroxide.

Antipyretic and Antirheumatic. Dose—10 to 30 grs. in water.

Used in making *Bismuthi Salicylas*.

Salicylic Acid or its Sodium Salt should not be prescribed with Quinine in a mixture.

ACIDUM SULPHURICUM (Sulphuric Acid), H_2SO_4 .

A heavy, colourless liquid, of oily consistence, formed by burning sulphur, and acting on the resulting sulphurous acid

by means of nitrous and aqueous vapours. It contains 98 per cent. of real H_2SO_4 .

A powerful Corrosive.

Acidum Sulphuricum Aromaticum, 1 in 14.
(Synonym—Elixir of Vitriol.)

A deep red liquid, prepared by mixing 3 fl. ozs. sulphuric acid gradually with $29\frac{1}{2}$ ozs. alcohol (90 per cent.), and adding $\frac{1}{2}$ oz. spirit of cinnamon, and 10 ozs. tincture of ginger. Contains 13·8 per cent. H_2SO_4 .

Tonic and Astringent. Dose—5 to 20 mins., freely diluted.

IN—Infusum Cinchonæ Acidum.

Acidum Sulphuricum Dilutum, 1 in 12 nearly.

A colourless mixture of sulphuric acid 1 oz. $5\frac{1}{4}$ drs. and distilled water q.s. to measure 1 pint. Contains 13·65 per cent. H_2SO_4 .

Tonic and Astringent. Dose—5 to 20 mins., freely diluted.

IN—Infusum Rosæ Acidum.

ACIDUM SULPHUROSUM (Sulphurous Acid), H_2SO_3 .

Sulphurous anhydride (SO_2) dissolved in water, forming a colourless liquid, with a pungent sulphurous odour, and constituting 5 per cent. of the solution, equivalent to 6·4 per cent. H_2SO_3 . The SO_2 is prepared by burning S, or by boiling H_2SO_4 with carbon, mercury, or copper.

Antiseptic. Externally—Antiparasitic. Dose— $\frac{1}{2}$ to 1 dr.

ACIDUM TANNICUM (Tannic Acid), $\text{C}_{14}\text{H}_{10}\text{O}_9\cdot 2\text{H}_2\text{O}$.
(Synonym—Tannin.)

An acid in pale brownish powder, consisting of thin glistening scales, extracted by water-saturated ether from galls which have been subjected to a special fermentation.

Powerfully Astringent. Readily soluble in water.

Dose—2 to 5 grs. in pill, powder, or solution.

Glycerinum Acidi Tannici, 1 in 5. (1 in $6\frac{1}{4}$ by weight.)

A brownish-green viscid fluid, prepared by triturating tannic acid 1 oz. with glycerin to make 5 ozs.

Local Astringent and Styptic.

Suppositoria Acidi Tannici, 3 grs. in each.

Tannic acid 3 grs., and oil of theobroma 12 grs.

Local Astringent and Styptic.

Trochiscus Acidi Tannici, $\frac{1}{2}$ gr. in each.

Composed of tannic acid with fruit basis.

ACIDUM TARTARICUM (Tartaric Acid), $C_4H_6O_6$.

An acid, in colourless crystals, prepared from the acid tartrate of potassium.

Refrigerant. Chiefly used in effervescing mixtures.

Dose—5 to 20 grs. in water.

IN—Mag. Sulph. Efferves., Sodii Phosph. Efferves., Sodii Sulph. Efferves., Pulv. Sodæ Tart. Efferves., and Lithii Citras Efferves.

ACONITI RADIX (Aconite Root)—Ranunculaceæ.

The dried root of *Aconitum Napellus*, marked with the scars and bases of broken rootlets. A brownish-black tapering root, collected in autumn from cultivated British plants.

Cardiac Sedative, Diaphoretic and Local Anodyne.

Active principles—Aconitine, Benzaconine, and Aconine.

Linimentum Aconiti, 1 in $1\frac{1}{2}$.

A brown liquid, prepared by macerating and percolating aconite root 20 ozs. in No. 40 powder with 30 ozs. alcohol (90 per cent.) and adding 1 oz. camphor. Product 30 ozs.

A powerful Local Anodyne. For external use only.

Tinctura Aconiti, 1 in 20.

A pale sherry-coloured liquid, prepared by percolating dried aconite root 1 oz. in No. 40 powder with alcohol (70 per cent.) 1 pint.

Dose—5 to 15 mins.; if very frequently repeated, 2 to 5 mins.

Aconitina (Aconitine), $C_{33}H_{45}NO_{12}$.

A colourless alkaloid, obtained from aconite root.

A Local Anodyne. Should not be given internally.

Unguentum Aconitinæ, 1 in 50.

An ointment, composed of aconitine 10 grs.; oleic acid 80 grs., lard 410 grs.

Local Anodyne—Similar in action to the liniment.

ADEPS (Lard).

The fresh fat from the abdomen of the hog, *Sus scrofa*, purified by melting at a temperature of 135° F. and straining.

It enters into the preparation of 20 ointments (either as lard or benzoated lard), into *Emplastrum Cantharidis*, and *Pil. Phosphori*.

ADEPS BENZOATUS (Benzoated Lard), 1 to $33\frac{1}{3}$.

Made by heating 1 lb. of lard and 210 grs. of benzoin for two hours on a water-bath and straining.

Emollient. Less liable to decompose than Adeps.

Enters into the composition of 12 ointments.

ADEPS LANÆ (Wool Fat).

A yellowish, sticky unctuous, almost odourless, substance, being the purified cholesterin-fat of sheep's wool. Used for the preparation of

Adeps Lanæ Hydrosus (Hydrous Wool Fat).

Commonly known as Lanoline, and prepared by triturating in a warm mortar, 3 ozs. distilled water added gradually to 7 ozs. wool fat.

Emollient. Used as a basis for ointments.

IN—Unguentum Conii and Ung. Hamamelidis.

ÆTHER (Ether), $(C_2H_5)_2O$.

A colourless, volatile, inflammable liquid, with a strong odour, containing not less than 92 per cent. by vol. of ethyl oxide, prepared from alcohol by interaction with sulphuric acid. Formerly termed "sulphuric ether."

A general Diffusible Stimulant, Anæsthetic, and Narcotic.

Dose—10 to 30 mins. for repeated administration ; 40 to 60 mins. for single dose, in syrup or water.

IN—Collodium, Collodium Flexile, Tinct. Lobeliæ Ætherea, and the following :

Æther Purificatus (Purified Ether).

Ether freed from alcohol and water by the action of chloride of calcium, lime, and redistillation.

Used externally as a Local Anæsthetic.

Spiritus Ætheris, 1 in 3.

Ether 10 ozs., alcohol (90 per cent.) 20 ozs. (mixed)—making a colourless liquid.

Dose—20 to 40 mins. for repeated use ; 60 to 90 mins. for single dose.

IN—Tinctura Lobeliæ Ætherea.

Spiritus Ætheris Compositus, 1 in 8 nearly.

(Synonym—Hoffman's Anodyne.) A colourless liquid, consisting of heavy oil of wine—prepared by the action of 36 ozs. sulphuric acid on 40 ozs. alcohol (90 per cent.)— $5\frac{1}{2}$ ozs. of ether, and 38 ozs. alcohol (90 per cent.)

Stimulant and Anodyne. Dose—same as Spt. Ætheris.

Spiritus Ætheris Nitrosi (Spirit of Nitrous Ether).

(Synonym—Sweet Spirit of Nitre.) A transparent and almost "colourless alcoholic solution containing ethyl nitrite, aldehyde, and other substances," obtained by cautiously heat-

ing together 3 ozs. nitric acid, 2 ozs. sulphuric acid, 2 ozs. copper wire, and 1 pint alcohol (90 per cent.) in a retort, and afterwards adding q.s. alcohol (90 per cent.) to the distillate, so that it may contain $2\frac{1}{2}$ per cent. ethyl nitrite.

Diaphoretic, Diuretic, and Vaso-dilator.

Dose—Same as Spt. *Ætheris*; 8 mins. for a child 1 year old.

ÆTHER ACETICUS (Acetic Ether), $\text{CH}_3\text{COO}(\text{C}_2\text{H}_5)$.

A colourless liquid, consisting chiefly of ethyl acetate, with an agreeable odour, prepared by distilling dried sodium acetate, ethylic alcohol, and sulphuric acid, and purifying by the action of potassium carbonate and subsequent distillation.

Stimulant. Dose—20 to 40 mins. for repeated administration; 60 to 90 mins. for single dose.

IN—Liquor Epispasticus.

ALCOHOL ABSOLUTUM (Absolute Alcohol), $\text{C}_2\text{H}_5\text{HO}$.

A colourless liquid, containing not more than 1 per cent. of water, prepared by extracting water from less strong ethylic alcohol and subsequent distillation. S.G. from .794 to .7969.

Used in the preparation of Chloroform, Liq. Sodii Ethylatis, and Liq. Ethyl Nitritis.

ALCOHOLS (90 per cent., 70 per cent., 60 per cent., 45 per cent., and 20 per cent.), see under *Spiritus Rectificatus*.

ALOE BARBADENSIS (Barbados Aloes)—*Liliacæ*.

The juice which flows from the transversely cut leaves of *Aloe vera*, *A. chinensis*, and probably other species evaporated to dryness; from the West Indian Islands in masses varying in colour from yellowish- or reddish-brown to chocolate-brown or almost black, with a disagreeable odour like the axilla. The powder is a dull greenish-yellow. Known as Barbados and Curaçao aloes.

Dose—2 to 5 grs.

ALOE SOCOTRINA (Socotrine Aloes)—*Liliacæ*.

The juice which flows from the transversely cut leaves of *Aloe Perryi*, and probably other species, evaporated to dryness. Imported principally by way of Bombay in *golden* or reddish-brown masses, the small fragments of which are translucent at the edges, with an agreeable strong odour. The powder is of a bright yellow or orange-brown colour.

Cathartic—Both varieties are similar in action and dose, and their active principle is Aloin (Barbaloin and Socaloin).

ALOUNUM (Aloin), $C_{16}H_{16}O_7 \cdot 3H_2O$.

Yellow inodorous tufts of acicular crystals, extracted from Barbados or Socotrine aloes by solvents, and purified by recrystallisation.

Cathartic. Dose— $\frac{1}{2}$ to 2 grs. in pill.

In addition to the preparations bearing the name Aloes, all of which are given in the following pages, the drug enters into

Pil. Cambogiæ Co. 1 in 6.

Pil. Colocynth. Co., 1 in 3.

Pil. Colocy. et Hyoscy.,

1 in $4\frac{1}{2}$

Pil. Rhei Co., 1 in 6.

Extract. Colocynth. Co.,

1 in $2\frac{1}{4}$.

Tinct. Benzoini Co., 1 in 60.

Decoctum Aloes Compositum, 4 grs. (Ext.) in 1 oz.

A rich dark brown liquid, prepared by boiling together for five minutes extract of Barbados aloes $\frac{1}{2}$ oz. ; myrrh, saffron, and potassium carbonate, of each $\frac{1}{4}$ oz. ; extract of liquorice, 2 ozs. ; compound tincture of cardamoms, 15 ozs. ; distilled water to 50 ozs. The tincture should be added after cooling.

Dose— $\frac{1}{2}$ to 2 ozs.

Extractum Aloes Barbadosis, 4 parts from 5.

A *solid* extract, obtained by dissolving Barbados aloes in boiling water, and evaporating the solution.

Dose—1 to 4 grs. in pill. It is less liable to gripe than the powdered aloes.

Pilula Aloes Barbadosis, 1 in 2.

Barbados aloes (in powder), 2 ozs. ; hard soap (in powder), 1 oz. ; oil of caraway, 1 dr. ; confection of roses, 1 oz.

Dose—4 to 8 grs.

Pilula Aloes Socotrinæ, 1 in 2.

Socotrine aloes (in powder), 2 ozs. ; hard soap (in powder), 1 oz. ; oil of nutmeg, 1 dr. ; confection of roses, 1 oz.

Dose—4 to 8 grs.

Pilula Aloes et Asafetidæ, 1 in 4.

Socotrine aloes, asafetida, hard soap, and confection of roses, of each 1 oz.

Cathartic and Antispasmodic. Dose—4 to 8 grs.

Pilula Aloes et Ferri, 1 in 9.

Exsiccated ferrous sulphate, 1 oz. ; Barbados aloes, 2 ozs. ; compound powder of cinnamon, 3 ozs. ; syrup of glucose, 3 ozs.

Cathartic and Emmenagogue. Dose—4 to 8 grs.

Pilula Aloes et Myrrhæ, 1 in $2\frac{1}{4}$.

Socotrine aloes, 2 ozs. ; myrrh, 1 oz. ; syrup of glucose, $1\frac{1}{2}$ ozs. Known as Rufus' Pill.

Cathartic and Emmenagogue. Dose—4 to 8 grs.

Tinctura Aloes, 1 of Ext. in 40.

A dark brown liquid, prepared by macerating extract of Barbados aloes $\frac{1}{2}$ oz. in liquid extract of liquorice 3 ozs., and alcohol (45 per cent.) to 1 pint.

Dose— $\frac{1}{2}$ to 1 drachm for repeated use ; $1\frac{1}{2}$ to 2 drs. for single dose.

ALUMEN (Alum), $\text{Al}_2(\text{SO}_4)_3\text{K}_2\text{SO}_4, 24\text{H}_2\text{O}$.

Or $\text{Al}_2(\text{SO}_4)_3(\text{NH}_4)_2\text{SO}_4, 24\text{H}_2\text{O}$.

Aluminium and potassium sulphate (potassium alum), or aluminium and ammonium sulphate (ammonium alum), produced by the combination of aluminium sulphate with potassium sulphate or with ammonium sulphate, in colourless transparent crystalline masses. Crystals soluble in 11 parts of water.

Astringent. In large doses Emetic. Dose—5 to 10 grs.

Alumen Exsiccatum (Exsiccated Alum), $\text{Al}_2(\text{SO}_4)_3\text{K}_2\text{SO}_4$.

Prepared by heating potassium alum until it loses 45 to 46 per cent. of its weight.

Externally—Styptic.

Glycerinum Aluminis, 1 in 6 (1 in $7\frac{1}{2}$ by weight).

A colourless syrupy liquid, prepared by triturating and warming (if necessary) 1 oz. alum with 3 drs. water, and glycerin to 6 ozs., and pouring off the clear liquid from any deposit after settling.

Local Astringent.

AMMONIACUM (Ammoniacum)—Umbelliferae.

A gum-resin exuded from the flowering and fruiting stem of *Dorema Ammoniacum*, and probably of other species, in pale brown or yellow tears or masses ; the fractured surface has a waxy lustre.

A Stimulating Expectorant. Dose—5 to 15 grs.

Emplastrum Ammoniaci cum Hydrargyro, 12 in 15.

Ammoniacum, 12 ozs. ; mercury, 3 ozs. ; olive oil, 56 grs. ; sulphur, 8 grs. ; mixed with the aid of heat.

Resolvent to enlarged glands.

Mistura Ammoniaci, $13\frac{1}{2}$ grs. in 1 oz.

Ammoniacum $\frac{1}{4}$ oz. rubbed with $7\frac{1}{2}$ ozs. distilled water, and 4 drs. syrup of tolu, and strained through muslin to form a whitish emulsion, like dirty milk.

Dose— $\frac{1}{2}$ to 1 oz.

Ammoniacum also enters into the composition of Pil. Scillæ Co. and Pil. Ipecac. cum Scilla.

AMMONII BENZOAS (Ammonium Benzoate).

Colourless laminar crystals, prepared by neutralising solution of ammonia with benzoic acid.

Diuretic. Dose—5 to 15 grs. in water.

Ammonii Bromidum, NH_4Br .

In colourless crystals, very soluble in water; formed by neutralising hydrobromic acid with ammonia.

Laryngeal Sedative. Useful in Whooping Cough.

Dose—5 to 30 grs. For a child 1 year old, 2 grs.

Ammonii Carbonas, $\text{N}_3\text{H}_{11}\text{C}_2\text{O}_5$ ($\text{NH}_4\text{HCO}_3 + \text{NH}_4\text{NH}_2\text{CO}_2$).

A volatile salt, consisting of a variable mixture of ammonium hydrogen carbonate with ammonium carbamate, occurring in translucent crystalline masses, with strong ammoniacal odour, and produced on heating ammonium sulphate or chloride with calcium carbonate.

A Diffusible Stimulant, Expectorant and Emetic.

Dose—3 to 10 grs.; 13 grs. neutralise $\frac{1}{2}$ oz. lemon juice.

Used in preparing—Liq. Ammon. Acet., Liq. Ammon. Cit., Spt. Ammon. Aromat., and Bismuth. Carb.

Ammonii Chloridum, NH_4Cl .

In colourless, inodorous crystals; very soluble in water; prepared by neutralising hydrochloric acid with ammonia. Known as Sal Ammoniac.

Expectorant and Ciliary Excitant.

Dose—5 to 20 grs.

Used in preparing—Liq. Ammoniaë Fortis.

Ammonii Phosphas, $(\text{NH}_4)_2\text{HPO}_4$.

In transparent colourless prisms, obtained by neutralising ammonia with phosphoric acid.

Diuretic. Dose—5 to 20 grs. in water.

Linimentum Ammoniaë, 1 in 4.

An emulsion known as "hartshorn and oil," composed of—solution of ammonia, 1 oz.; almond oil, 1 oz.; and olive oil, 2 ozs. Rubefacient.

Liquor Ammoniaë Fortis, NH_3 ; 15·8 grs. NH_3 in 1 dr.

Ammoniacal gas, dissolved in water, and constituting 32·5 per cent. of the solution, prepared by heating a mixture of ammonium chloride and slaked lime, and passing the resulting ammonia into water.

Vesicant. Should not be used internally.

IN—Liniment. Camph. Co., Lin. Hydrarg., Liquor Ammoniaë, Spiritus Ammoniaë Aromaticus, Spt. Am. Fetid., and Tr. Guaiaci Ammon.

Liquor Ammoniae, NH_3 1 in 3.—5·2 grs. NH_3 in 1 dr.

Ammoniacal gas, dissolved in water, and constituting 10 per cent. of the liquid, prepared by mixing 1 pint of strong solution of ammonia with 2 pints of distilled water.

Stimulant and Rubefacient.

IN—Linim. Ammoniae, Tr. Quininæ Ammon., Tr. Ergotæ Ammon., Tr. Valer. Ammon., and Tr. Opii Ammon.

Liquor Ammonii Acetatis, $\text{NH}_4\text{C}_2\text{H}_3\text{O}_2$ about $6\frac{1}{2}$ per cent.

A colourless liquid, prepared by neutralising 1 oz. ammonium carbonate with q.s. acetic acid, and adding water to 1 pint.

Diuretic and Diaphoretic. Dose—2 to 6 drs.

Liquor Ammonii Citratis, $(\text{NH}_4)_3\text{C}_6\text{H}_5\text{O}_7$, nearly 16 per cent.

A colourless liquid, prepared by neutralising $2\frac{1}{2}$ ozs. citric acid with about $1\frac{3}{4}$ ozs. ammonium carbonate, and adding distilled water to 1 pint.

Diuretic. Dose—2 to 6 drs.

Spiritus Ammoniae Aromaticus, 1 of Carbonate and 2 of Liq. Ammon. Fort. in 40. (Synonyms—Spiritus Ammoniae Compositus ; Spirit of Sal Volatile.)

An almost colourless liquid, prepared by distilling $4\frac{1}{2}$ drs. oil of nutmeg, $6\frac{1}{2}$ drs. oil of lemon, 6 pints alcohol (90 per cent.), and 3 pints of water. 7 pints are collected and set aside ; 9 ozs. are then collected, and in this quantity are dissolved with a gentle heat 4 ozs. carbonate of ammonia, and 8 ozs. strong solution of ammonia, the solution being then added to the 7 pints of distillate.

Cardiac Stimulant. Dose—20 to 40 mins. for repeated use ; 60 to 90 mins. for single dose, freely diluted.

Often wrongly prescribed with Syrup of Squill, which contains free acid.

IN—Mist. Sennæ Co.

Spiritus Ammoniae Fetidus, 1 of Liq. Am. Fort. in 10.

Prepared by distilling $1\frac{1}{2}$ ozs. asafetida with q.s. alcohol (90 per cent.), and adding to the distillate 2 ozs. strong solution of ammonia and alcohol (90 per cent.) to measure 20 ozs.

Stimulant and Antispasmodic. Dose—20 to 40 mins. for repeated use ; 60 to 90 mins. for single dose, freely diluted.

AMYGDALA AMARA (Bitter Almond)—Rosaceæ.

The ripe seed of *Prunus Amygdalus var. amara*. Has a bitter taste, is broader and shorter than the sweet almond, and its aqueous emulsion has the odour of peach blossom.

Yields, when pressed, Oleum Amygdalæ, and contains Amygdalin and Emulsin, which form with water—Prussic Acid.

Amygdala Dulcis (Sweet or Jordan Almond)—Rosaceæ.

The ripe seed of *Prunus Amygdalus var. dulcis*; about 1 inch in length, narrow, and sharp-pointed, with clear brown seed coat, and a sweet taste.

Nutrient and Demulcent.

Yields, when pressed, *Oleum Amygdalæ*, and enters into.

Pulvis Amygdalæ Compositus, 8 in 13.

A coarse, whitish powder, composed of 8 ozs. of *sweet* almonds (with their coats removed by steeping in hot water), 4 ozs. sugar, and 1 oz. powdered gum acacia.

Mistura Amygdalæ, 1 in 8.

A white emulsion, made by rubbing 2 ozs. of compound powder of almonds with 16 ozs. of distilled water, and straining through fine muslin.

Dose— $\frac{1}{2}$ to 1 oz.

Chiefly used as a vehicle for other medicines, and as a basis for lotions.

Oleum Amygdalæ (Almond Oil).

The pale yellow, almost inodorous, fixed oil, expressed from *bitter* or *sweet* almonds.

Demulcent and Emollient.

Used in the preparation of spermaceti and rose-water ointments, in phosphorated oil, and liniment of ammonia.

(This harmless oil, which is commonly called almond oil, should not be confounded with the oil *distilled* from the bitter almond, which is known as the oil of bitter almonds, and which is a deadly poison, being four times the strength of dilute hydrocyanic acid. It is not, however, in the Pharmacopœia.)

AMYL NITRIS (Amyl Nitrite), $C_5H_{11}NO_2$.

An ethereal, yellowish liquid, with a fragrant odour, prepared by the interaction of nitrous acid and amylic alcohol that has been distilled between 262° and 270° F. It consists chiefly of iso-amyl nitrite, but contains other nitrites.

Vaso-dilator, acting powerfully on arterial spasm.

Dose for inhalation—The vapour of 2 to 5 mins. It may be swallowed in the form of capsule, in doses of $\frac{1}{2}$ to 1 min.

AMYLUM (Starch)—From Graminaceæ.

Starch procured from the grains of common wheat (*Triticum sativum*); maize (*Zea Mays*); and rice (*Oryza sativa*), in white powder or in columnar masses.

Dietetic and Demulcent. Antidote in poisoning by iodine.

In addition to the following, it enters into Compound Tragacanth Powder.

Glycerinum Amyli, 1 to 8. 1 in 10 $\frac{1}{4}$ by weight.

A translucent jelly, prepared by heating 1 oz. starch, 6 $\frac{1}{2}$ ozs. glycerin, and 1 $\frac{1}{2}$ ozs. distilled water.

An Emollient application for external use.

Preparations of iodine should not be ordered with starch.

ANETHI FRUCTUS (Dill Fruit)—Umbelliferæ.

The oval, flat, brown, dried, ripe fruit, in separate mericarps, $\frac{1}{8}$ inch long, with an aromatic odour, of *Peucedanum graveolens*.

Carminative.

Aqua Anethi, 1 lb. to 1 gall.

A colourless liquid, prepared by distilling 1 gall. from 1 lb. dill fruit and 2 gals. water.

Dose— $\frac{1}{2}$ to 2 ozs. for adults. A favourite drug in the colic of infants. 1 to 2 drs. for a child 1 year old.

Oleum Anethi.

The pale yellow oil, distilled from dill fruit.

Antispasmodic and Carminative. Dose— $\frac{1}{2}$ to 3 mins.

ANISI FRUCTUS (Anise Fruit)—Umbelliferæ.

The dried fruit of *Pimpinella Anisum*, $\frac{1}{5}$ inch long, ovoid, the mericarps usually remaining united, are greyish brown, and covered with hairs.

Antispasmodic and Carminative.

Conium fruit is distinguished from Anise by its consisting of single mericarps, which are smooth and grooved.

Aqua Anisi, 1 lb. to 1 gall.

A colourless water obtained by distilling 1 gall. from 2 gals. water and 1 lb. anise fruit.

Carminative and Antispasmodic.

Dose—1 to 2 drs. for a child 1 year old.

Oleum Anisi.

The colourless or pale yellow oil distilled from anise fruit, or from the fruit of Star-anise, *Illicium verum*.

Antispasmodic and Carminative. Dose— $\frac{1}{2}$ to 3 mins.

In—Tinct. Camphoræ Co., Tinct. Opii Ammon., and

Spiritus Anisi, 1 in 10.

The colourless solution, prepared by mixing 1 oz. oil of anise with alcohol (90 per cent.) q.s. to make 10 ozs.

Carminative and Antispasmodic.

Dose—5 to 20 mins. For a child 1 year old, 5 mins.

ANTHEMIDIS FLORES (Chamomile Flowers)—Compositæ.

The dried expanded flower-heads of *Anthemis nobilis*, resembling dried daisy-heads, from cultivated plants.

An Aromatic Stimulant and Bitter Tonic.

Extractum Anthemidis.

A soft extract, prepared by evaporating a decoction of flowers, and adding 15 mins. of oil of chamomile for every pound of flowers. ~~427~~ This is the only extract to which an oil is added.

Dose—2 to 8 grs.

Oleum Anthemidis.

The pale blue or greenish-blue oil, which gradually becomes yellowish-brown, distilled from chamomile flowers.

Used in making the extract.

Dose— $\frac{1}{2}$ to 3 mins., on sugar or in mucilage.

ANTIMONIUM NIGRUM PURIFICATUM (Antimonious Sulphide), Sb_2S_3 .

Purified black antimony, in the form of a greyish-black powder, being the native sulphide purified from siliceous matter by fusion, and, if necessary, from arsenic by maceration with solution of ammonia.

Only used to make Antim. Sulphuratum.

Antimonii Oxidum, Sb_4O_6 .

A greyish-white powder, prepared by pouring a solution of antimonious chloride into water, and decomposing the oxychloride thus formed with carbonate of sodium.

Diaphoretic and Emetic.

Dose—1 to 2 grs. For a child 1 year old, $\frac{1}{8}$ to $\frac{1}{4}$ gr.

Used in the preparation of Antimon. Tartaratum, and in

Pulvis Antimonialis (Antimonial Powder), 1 in 3.

A substitute for James's powder, consisting of oxide of antimony 1 oz. and calcium phosphate 2 ozs.

Acts like the Oxide, only weaker.

Dose—3 to 6 grs. For a child 1 year old, $\frac{1}{4}$ to $\frac{1}{2}$ gr.

Antimonium Sulphuratum, $\text{Sb}_2\text{S}_5, \text{Sb}_2\text{O}_5, \text{Sb}_2\text{S}_3, \text{Sb}_4\text{O}_6$ and S.

An orange-red powder, known as sulphurated antimony, prepared by boiling antimonious sulphide with sublimed sulphur and caustic soda, adding diluted sulphuric acid and water to the solution before it cools, collecting, washing, and drying the precipitate.

Alterative, Emetic, and Diaphoretic. Dose—1 to 2 grs.

IN—Pilula Hydrargyri Subchloridi Composita—(1 in 4 $\frac{1}{2}$).

Antimonium Tartaratum, $(K(SbO)C_4H_4O_6)_2, H_2O$.

(Tartarated Antimony). (Synonyms—Tartar Emetic ; Potassio-tartrate of Antimony.) In colourless, transparent crystals, with triangular facets ; soluble in water ; prepared by setting aside a mixture of antimonious oxide and acid potassium tartrate made into a paste with a little water, until combination has taken place, and purifying by crystallisation.

Emetic, Cardiac Depressant, Expectorant.

Dose—As an Emetic, 1 to 2 grs. (For a child 1 year old, $\frac{1}{8}$ gr.) Diaphoretic, $\frac{1}{24}$ to $\frac{1}{8}$ gr. ; as an Expectorant, $\frac{1}{8}$ to $\frac{1}{4}$ gr. Given in solution in water.

Vinum Antimoniale (Antimonial Wine), 2 grs. in 1 oz.

Tartarated antimony, 40 grs., dissolved in boiling water 1 oz. and added to sherry q.s. to 1 pint ; making a pale yellowish-brown liquid.

Dose—10 to 30 mins. As an Emetic, 2 to 4 drs. For a child 1 year old, 3 mins. as an Expectorant ; and 15 mins. as an Emetic.

APOMORPHINÆ HYDROCHLORIDUM, $C_{17}H_{17}NO_2HCl$.

(Apomorphine Hydrochloride.)

(Hydrochlorate of Apomorphine B.P. 85.) The hydrochloride of an alkaloid, obtained by heating morphine or codeine hydrochloride in sealed tubes with HCl ; in small, greyish-white acicular crystals, turning green on exposure to light and air, and soluble in 50 parts of water.

Powerfully Emetic and Expectorant.

Dose— $\frac{1}{20}$ to $\frac{1}{10}$ gr. hypodermically as an Emetic ; $\frac{1}{10}$ to $\frac{1}{4}$ gr. by the mouth as an Expectorant.

Injectio Apomorphinæ Hypodermica, 1 gr. in 110 mins.

A recently-prepared solution of 1 gr. apomorphine hydrochloride in a mixture of 1 min. dilute HCl and 110 mins. water which has been boiled and cooled. Product, 110 mins.

Dose—5 to 10 mins. by subcutaneous injection.

AQUA DESTILLATA (Distilled Water), H_2O .

Prepared from potable water.

ARAROA (Araroba), Leguminosæ.

(Synonyms—Goa Powder ; Crude Chrysarobin.)

A substance found in cavities in the trunk of Andira Araroba freed as much as possible from fragments of wood, dried and powdered, having a colour varying from brownish-yellow to umber brown.

Used for production of chrysarobin, which is its active principle (p. 213).

ARGENTI NITRAS (Synonym—Lunar Caustic), AgNO_3 .

In flat, colourless crystals, prepared by the interaction of nitric acid and silver. To make the rods commonly known as "Lunar Caustic," the fused crystals are poured into moulds.

Caustic, Astringent, and Nerve Tonic.

Dose— $\frac{1}{4}$ to $\frac{1}{2}$ gr. (in pill). (Sometimes 1 gr. is given in stomach affections.)

As a strong caustic lotion for wounds, ulcers, etc., 1 dr. to 1 oz. As a lotion for ophthalmia in infants, 8 grs. to 1 oz. As an injection for the urethra, 2 grs. to 1 oz.

All solutions of caustic should be made with distilled water, and should not contain any trace of organic matter. Sometimes, however, the salt is dissolved in Spt. Æther. Nit.

Argenti Nitras Induratus (Toughened Caustic).

In white or greyish-white cylindrical rods or cones, prepared by fusing together 475 grs. silver nitrate and 25 grs. potassium nitrate, and pouring the melted mass into moulds.

Used locally as a powerful Astringent and Caustic.

Argenti Nitras Mitigatus (Mitigated Caustic).

White or greyish-white cylindrical rods or cones, prepared by fusion of 1 oz. silver nitrate and 2 ozs. potassium nitrate. Caustic.

Argenti Oxidum, Ag_2O .

The brown powder precipitated on mixing solutions of silver nitrate and calcium hydroxide.

Tonic and Antispasmodic. Dose— $\frac{1}{2}$ to 2 grs., in pill. Pills containing this salt with organic matter, as extracts, alkaloids, etc., rapidly decompose and sometimes explode.

ARMORACIÆ RADIX (Horseradish Root)—Cruciferae.

The *fresh* root of Cochlearia Armoracia, from cultivated plants. It has often been unreasonably confounded with aconite. A comparison shows—

Aconite Root

To be smaller, distinctly tapering to a point, brown on the exterior, odourless, and leaving a tingling sensation on being chewed.

Horseradish Root

To be larger, much longer, more uniform in circumference, white or cream coloured externally, with strong odour, after being scraped, and with a characteristic taste.

Diuretic, Stimulant, and Sialagogue.

It contains a ferment which with water forms an oil almost identical with Volatile Oil of Mustard.

Spiritus Armoracæ Compositus, 1 in 8.

A colourless liquid, prepared by mixing 5 ozs. each of scraped horseradish root and bitter-orange peel, 55 grs. nutmeg, $1\frac{1}{4}$ pints alcohol (90 per cent.), and $1\frac{1}{2}$ pints water, and distilling 1 quart.

Stimulant and Diuretic. Dose—1 to 2 drs.

ARNICÆ RHIZOMA (Arnica Rhizome)—Compositæ.

(Synonym—*Arnica Radix*). The dried rhizome and roots of *Arnica montana*, from 1 to 2 inches long, and $\frac{1}{8}$ to $\frac{1}{4}$ inch thick; curved, rough, and bearing amplexicaul leaf-scars; beset on under surface with numerous brittle, wiry rootlets, and usually terminated by the hairy remains of the stem and leaves. Its peppery taste and peculiar odour distinguish it from *Hydrastis*, *Senega*, *Serpentary*, and *Valerian*, which it somewhat resembles.

Active principles—*Arnicin* and *Inulin*, also an *Essential Oil*.

Tinctura Arnicæ, 1 oz. to 1 pint.

A brandy-coloured liquid, obtained by percolation of 1 oz. *arnica rhizome* with alcohol (70 per cent.), to 1 pint.

Chiefly used as a lotion for bruises, 1 oz. to 40 ozs. water, but should be used with caution, as it may cause erythema.

Arsenii Iodidum (*Vide* under *Acid. Arseniosum*.)**ASAFETIDA** (*Asafetida*)—Umbelliferæ.

The fetid gum-resin, in irregular softish masses or tears, of a dull yellow colour, which darken by keeping, obtained by incisions from the root of *Ferula foetida*, and probably other species.

Active principle is an ethereal oil—*Allyl Sulphide*.

Stimulant and Antispasmodic. Dose—5 to 15 grs.

IN—*Pil. Galbani Co.*

Pilula Aloes et Asafetidæ, 1 in 4.

Socotrine aloes, *asafetida*, hard soap, and confection of roses, of each 1 oz., well beaten together.

Cathartic and Antispasmodic. Dose—4 to 8 grs.

Spiritus Ammoniæ Fetidus, 33 grs. *Asafetida* in 1 oz.

A clear, faintly-yellow liquid, prepared by distilling a mixture of *asafetida* $1\frac{1}{2}$ ozs. and alcohol (90 per cent.) 15 ozs., and adding to the distilled spirit 2 ozs. strong solution of ammonia, with as much alcohol (90 per cent.) as will make the product measure 20 ozs.

Dose—20 to 40 mins. for repeated administration; 60 to 90 mins. for single dose, freely diluted with water.

Tinctura Asafetidæ, 1 in 5. ($87\frac{1}{2}$ grs. in 1 oz.)

A bright brown liquid, prepared by macerating 4 ozs. asafetida in alcohol (70 per cent.) to make 1 pint.

Dose— $\frac{1}{2}$ to 1 drm.

ATROPINA (Atropine), $C_{17}H_{23}NO_3$.

An alkaloid in colourless crystals, obtained from belladonna leaves or root.

Sedative, Local Anodyne and Mydriatic. Dose— $\frac{1}{200}$ to $\frac{1}{100}$ grain.

Unguentum Atropinæ, 1 in 50.

A white ointment, prepared by dissolving atropine 10 grs. in oleic acid 40 grs., and mixing with lard 450 grs.

A Local Anodyne.

Atropinæ Sulphas, $(C_{17}H_{23}NO_3)_2H_2SO_4$.

A nearly colourless crystalline powder, obtained by neutralising atropine with dilute sulphuric acid.

Dose and action like atropine ; it is very soluble.

Lamellæ Atropinæ (Discs of Atropine).

Discs of gelatin with some glycerin, each weighing about $\frac{1}{50}$ gr. and containing $\frac{1}{5000}$ gr. atropine sulphate.

Liquor Atropinæ Sulphatis, 1 gr. in 110 mins.

A colourless solution of $17\frac{1}{2}$ grs. atropine sulphate and 2 grs. salicylic acid in water, which has been boiled and cooled, to make 4 ozs. Containing no spirit, its introduction into the eye does not cause pain.

Dose— $\frac{1}{2}$ to 1 min.

AURANTII CORTEX RECENS (Fresh Bitter-Orange Peel)—
Aurantiacæ.

AURANTII CORTEX SICCATUS (Dried Bitter-Orange Peel)—
Aurantiacæ.

The fresh and dried outer part of the pericarp of *Citrus Aurantium var. Bigaradia*.

Active principles—Hesperidin and a volatile oil.

An Aromatic Bitter and Flavouring ingredient.

In addition to the preparations bearing its name, it enters into Infus. Gentianæ Co., Spirit. Armoraciæ Co., Tr. Cinchonæ Co., and Tr. Gentianæ Co.

Infusum Aurantii, 1 oz. to 1 pint ($\frac{1}{4}$ hour).

Dried bitter-orange peel 1 oz. infused in boiling water 1 pint.

A mild Stomachic Tonic. Dose— $\frac{1}{2}$ to 1 oz.

Infusum Aurantii Compositum, $\frac{1}{2}$ oz. to 1 pint. ($\frac{1}{4}$ hour).

Prepared by infusing in 1 pint boiling water, $\frac{1}{2}$ oz. dried bitter-orange peel, $\frac{1}{4}$ oz. fresh lemon peel, and 55 grs. cloves.

Dose— $\frac{1}{2}$ to 1 oz.

Syrupus Aurantii, 1 in 8.

1 oz. tincture of orange and 7 ozs. syrup, mixed.

Dose— $\frac{1}{2}$ to 1 dr.

Tinctura Aurantii, 5 ozs. to 1 pint.

Prepared by macerating 5 ozs. fresh bitter-orange peel in 1 pint alcohol (90 per cent.).

An agreeable Bitter Tonic and flavouring agent. Dose— $\frac{1}{2}$ to 1 dr.

IN—Conf. Sulphuris, Tinct. Quininæ, Syr. Aurant., Syr. Aromat., Syr. Cascaræ Aromat., Troch. Sulph.

Vinum Aurantii, 10 to 12 per cent. of alcohol.

Wine of a golden sherry colour, made by the fermentation of a saccharine solution, to which the fresh peel of the bitter-orange has been added.

An agreeable Bitter and Stimulating Tonic. Dose— $\frac{1}{2}$ to 2 ozs.

IN—Vinum Quininæ and Vinum Ferri Citratis.

Aqua Aurantii Floris (Orange-Flower Water).

The nearly colourless fragrant water distilled from the flowers of the bitter-orange tree, as found in commerce. To be diluted, immediately before use in dispensing, with twice its bulk of water.

IN—Mist. Olei Ricini, and Syr. Calcii Lactophosphatis.

Syrupus Aurantii Floris, 1 in $6\frac{3}{4}$.

Prepared by dissolving 3 lbs. of sugar in 16 ozs. of distilled water, and adding 8 ozs. of orange-flower water (undiluted) and making up to $4\frac{1}{2}$ lbs. with recently boiled water.

A sweet, colourless syrup, used for Flavouring.

Dose— $\frac{1}{2}$ to 1 dr.

BALSAMUM PERUVIANUM (Balsam of Peru)—Leguminosæ.

A dark viscid, liquid balsam, exuded from the trunk of Myroxylon Pereiræ, after the bark has been beaten and scorched.

Active ingredients—Cinnameine, Cinnamic and Benzoic Acids, and a Volatile Oil.

Expectorant. Externally—a Stimulant to ulcers and bed-sores.

Dose—5 to 15 mins., in mucilage or with beaten-up egg.

BALSAMUM TOLUTANUM (Balsam of Tolu)—Leguminosæ.

A fragrant, soft, solid balsam, obtained from incisions in the trunk of *Myroxylon Toluifera*.

Expectorant. Dose—5 to 15 grs., with mucilage or egg.

Active ingredients—Volatile Oil, Cinnamic and Benzoic Acids.

IN—Tr. Benzoini Co. and

Syrupus Tolutanus, 1 in 29.

A colourless syrup, prepared by boiling $1\frac{1}{4}$ ozs. balsam of tolu in 1 pint distilled water, filtering, and adding 2 lbs. sugar. Product, 3 lbs.

Dose— $\frac{1}{2}$ to 1 dr. Chiefly used to sweeten cough mixtures.

Enters into Mist. Ammoniaci.

Tinctura Tolutana, 2 ozs. to 1 pint.

A bright, reddish-brown liquid, prepared by dissolving 2 ozs. balsam of tolu in alcohol (90 per cent.) to make 1 pint.

A Stimulating Expectorant. Dose— $\frac{1}{2}$ to 1 dr.

IN—Tolu basis used in making 2 lozenges.

BELLADONNÆ FOLIA (Belladonna Leaves)—Solanaceæ.

The *fresh* ovate, acute, entire, glabrous leaves and branches of deadly nightshade (*Atropa Belladonna*), collected when the plant is in flower.

Active principles—Atropine and Hyoscyamine. The dried leaves contain little atropine, the chief active principle being Hyoscyamine.

Narcotic and Mydriatic. A powerful Poison.

May be used as a source of Atropine.

Extractum Belladonnæ Viride.

A soft, dark green extract, with a peculiar heavy odour, prepared from the juice of the fresh young leaves and branches of belladonna, which is heated gradually to 130° F., and the green colouring matter separated by a calico filter and laid aside. The strained liquor is heated to 200° F. to coagulate the albumin and again filtered. The filtered liquor is evaporated on a water-bath to the consistence of a syrup, the green colouring (previously separated and passed through a hair sieve) added, and the evaporation continued under 140° F. till the consistence of a soft extract is reached.

Anodyne and Sedative. Dose— $\frac{1}{4}$ to 1 gr. in pill.

Succus Belladonnæ.

The brownish juice of the fresh leaves and young branches of belladonna, with the addition of $\frac{1}{3}$ its bulk of alcohol (90 per cent.).

Action—Anodyne. Dose—5 to 15 mins. (Given in incontinence of urine and whooping-cough.)

BELLADONNÆ RADIX (Belladonna Root)—Solanaceæ.

The branched greyish-brown root, $\frac{1}{2}$ to 1 foot long, of *Atropa Belladonna*; collected in autumn and dried.

Active principles—Atropine, which, however, may not exist as such, the chief ingredient being Hyoscyamine, with traces of Hyoscyne or Scopolamine and Belladonnine.

In action resembles the leaves.

Used in preparing Atropine and the following—

Extractum Belladonnæ Liquidum (.75 per cent. alkaloids).

A dark brown liquid, prepared by percolation from belladonna root, and made to contain $\frac{3}{4}$ gr. alkaloids in 110 mins.

Extractum Belladonnæ Alcoholicum (1 per cent. alkaloids).

A dark semi-solid extract, prepared by evaporating the liquid extract, and adding sugar of milk, so that 15 ozs. of the extract may be obtained from 20 ozs. of liquid extract.

Dose— $\frac{1}{4}$ to 1 gr.

Emplastrum Belladonnæ (.5 per cent. alkaloids).

Prepared by evaporating 4 ozs. liquid extract of belladonna down to 1 oz., and adding 5 ozs. melted resin plaster.

A Local Anodyne.

Linimentum Belladonnæ (.38 per cent. alkaloids).

A light yellowish-brown coloured liquid, prepared by mixing liq. ext. of belladonna 10 ozs., camphor 1 oz., water 2 ozs., and alcohol (90 per cent.), q.s. to make 20 ozs.

A powerful Anodyne.

Suppositoria Belladonnæ ($\frac{1}{60}$ gr. alkaloids each).

Prepared by rubbing 18 grs. alcoholic extract of belladonna with a little oil of theobroma and adding oil of theobroma q.s. for 12 suppositories of 15 grs. each.

A local Anodyne.

Tinctura Belladonnæ (.048 to .052 per cent. alkaloids).

Prepared by mixing 2 ozs. liq. ext. of belladonna with alcohol (60 per cent.) q.s. to make 30 ozs.

Dose—5 to 15 mins. 1 min. for a child 1 year old.

Unguentum Belladonnæ (.6 per cent. alkaloids).

A brownish ointment, made by evaporating 2 ozs. of liquid extract of belladonna to $\frac{1}{4}$ oz., and mixing with it $2\frac{1}{4}$ ozs. benzoated lard.

A soothing application to Inflamed Piles.

☞ The preparations of belladonna intended for external use, especially the liniment and plaster, often cause serious and fatal poisoning, owing to the active principles being absorbed by the skin.

BENZOINUM (Benzoin)—Styraceæ.

The balsamic resin, in mottled masses or light brown lumps, made up of tears obtained from *Styrax Benzoin*, and probably other species. Known as Siam and Sumatra Benzoin.

Active ingredient is benzoic acid ; the Sumatra variety contains also cinnamic acid.

Diuretic and Expectorant, but seldom used internally.

IN—Adeps Benzoatus, Ungt. Cetacei, and the following :—

Tinctura Benzoini Composita, 2 ozs. to 1 pint.

(Synonym—Friar's Balsam.)

A dark, reddish-brown liquid, prepared by macerating 2 ozs. benzoin, $1\frac{1}{2}$ ozs. storax, $\frac{1}{2}$ oz. balsam of tolu, and 160 grs. Socotrine aloes in q.s. alcohol (90 per cent.) to make 1 pint.

A Stimulating Expectorant. Used as a protective and antiseptic coating for fresh wounds.

Dose— $\frac{1}{2}$ to 1 dr. in emulsion. Water decomposes it.

Benzoic Acid and Preparations. (See *Acidum Benzoicum*.)**BENZOL.**

A colourless volatile liquid, which is a mixture of homologous hydrocarbons obtained from light coal-tar oil. It contains about 70 per cent. benzene (C_6H_6), and 20 to 30 per cent. toluene (C_6H_5, CH_3). (It is also known as Benzene.)

Used in making Liq. Caoutchouc and Charta Sinapis.

BISMUTHI CARBONAS (Bismuth Oxycarbonate),

($Bi_2O_2CO_3$) $_2H_2O$.

A white powder, prepared by the interaction of bismuth nitrate and ammonium carbonate.

Antacid and Gastric Sedative. Dose—5 to 20 grs.

Liquor Bismuthi et Ammonii Citratis. About 3 grs. Bi_2O_3 in 1 dr. (Synonym—*Liquor Bismuthi*.)

A colourless solution, prepared thus—Dissolve 613 grs. bismuth oxynitrate in 1 oz. nitric acid (diluted), add water until liquid becomes opalescent. Add 613 grs. potassium citrate and 175 grs. potassium carbonate dissolved in water ; boil, cool, filter, and wash precipitate ; dissolve it in solution of ammonia q.s. and make up to 1 pint with water.

Dose— $\frac{1}{2}$ to 1 dr., diluted.

Bismuthi Oxidum, Bi_2O_3 .

A slightly brownish-yellow powder, prepared by boiling bismuth oxynitrate with solution of sodium hydroxide.

Action and dose same as Bismuthi Carbonas.

Bismuthi Salicylas (Bismuth Salicylate or Oxysalicylate),
 $C_6H_4.OH.CO_2.BiO$.

A white, or nearly white, amorphous insoluble powder, prepared by the interaction of bismuth nitrate and sodium salicylate.

Dose—5 to 20 grs. Gastric Sedative.

Bismuthi Subnitras (Bismuth Oxynitrate), $BiONO_3.H_2O$.

A heavy, white powder, prepared by the interaction of bismuth nitrate and water.

Action and dose same as Bismuthi Carbonas.

Trochiscus Bismuthi Compositus.

Each composed of bismuth oxycarbonate 2 grs., heavy magnesium carbonate 2 grs., precipitated calcium carbonate 4 grs., and rose basis.

BORAX (Borax), $Na_2B_4O_7.10H_2O$ (Sodium Pyroborate).

(Synonym—Biborate of Sodium.)

A native salt, in large, transparent, colourless crystals. Can be also obtained by neutralising native boric acid with sodium carbonate, or by boiling native calcium borate with solution of sodium carbonate.

Antiseptic, Emmenagogue, and Diuretic. Dose—5 to 20 grs.

Used in making Acid. Boric.

Glycerinum Boracis, 1 to 6. (1 in $8\frac{1}{2}$ by weight.)

A colourless, thick liquid, prepared by dissolving 1 oz. borax in 6 ozs. glycerin.

Used for its soothing action on diseased mucous surfaces.

Mel Boracis, 1 in $9\frac{1}{2}$.

A honey-like mixture of borax 1 oz., glycerin $\frac{1}{2}$ oz., and clarified honey 8 ozs.

Action similar to glycerin of borax.

Bromid. Ammonii, Potassii and Sodii. (See under respective headings.)

BUCHU FOLIA (Buchu Leaves)—Rutaceæ.

The dried leaves of *Barosma betulina*. Small, yellowish-green, shining, and smooth leaves, with a powerful minty odour. Marked with pellucid dots (oil glands) at the indentations and apex.

The active ingredient is the volatile oil from the oil glands.

A stimulating Diuretic.

Infusum Buchu, 1 oz. to 1 pint. ($\frac{1}{4}$ hour).

1 oz. bruised buchu leaves infused in 1 pint boiling water.

Dose—1 to 2 ozs.

Tinctura Buchu, 4 ozs. to 1 pint.

A brownish-green liquid, prepared by percolating 4 ozs. buchu leaves with 1 pint alcohol (60 per cent.).

Dose— $\frac{1}{2}$ to 1 dr.

BUTYL - CHLORAL HYDRAS (Butyl - Chloral Hydrate), $\text{CH}_3\text{CHClCCl}_2\text{CH(OH)}_2$. Formerly known as Croton-Chloral Hydrate.

Pearly white crystalline scales, with an odour like hydrate of chloral, produced by the action of chlorine gas on aldehyde, and converted by the addition of water into the crystalline hydrate, or trichlorobutylidene glycol.

Hypnotic and Anodyne to fifth nerve. Dose—5 to 20 grs.

CADINUM OLEUM (Oil of Cade)—Coniferae.

(Synonym—Juniper Tar Oil.) The brownish-black, oily, empyreumatic liquid obtained by the destructive distillation of the woody portions of *Juniperus Oxycedrus* and other species.

Stimulating application in Scaly Skin Diseases.

CAFFEINA (Caffeine), $\text{C}_8\text{H}_{10}\text{N}_4\text{O}_2\cdot\text{H}_2\text{O}$.

(Synonym—Theine.)

An alkaloid in colourless, *inodorous* silky crystals, obtained from the dried leaves of *Camellia Thea*, or the dried seeds of *Coffea arabica*.

Cardiac Tonic and Diuretic. Dose—1 to 5 grs.

Caffeinae Citras, $\text{C}_8\text{H}_{10}\text{N}_4\text{O}_2\cdot\text{H}_3\text{C}_6\text{H}_5\text{O}_7$.

A white, *inodorous* powder, which is unstable, prepared by dissolving 1 oz. caffeine, and 1 oz. citric acid in 2 ozs. water, and evaporating.

Cardiac Tonic and Diuretic. Dose—2 to 10 grs.

Caffeinae Citras Effervescens, 1 in 25.

A granular effervescent powder, consisting of sodium bicarbonate 51 ozs., tartaric acid 27 ozs., citric acid 18 ozs., sugar 14 ozs., and caffeine citrate 4 ozs., heated and granulated.

Dose—60 to 120 grs.

CAJUPUTI OLEUM (Oil of Cajuput)—Myrtaceae.

A bluish-green mobile oil, with camphoraceous odour, distilled from the leaves of *Melaleuca Leucadendron* (*M. Cajuputi*).

Diffusible Stimulant and Antispasmodic.

Dose— $\frac{1}{2}$ to 3 mins.

Resembles eucalyptus oil in composition, since it contains about 60 per cent. Cineol (eucalyptol or cajuputol) and some Pinene.

Spiritus Cajuputi, 1 in 10.

Oil of cajuput 1 oz. mixed with alcohol (90 per cent.) to 10 ozs.

Dose—5 to 20 mins.

Ol. Cajuputi enters into Linimentum Crotonis.

CALCII CARBONAS PRÆCIPITATUS, CaCO_3 .

(Precipitated Calcium Carbonate.) (Synonym—Precipitated Chalk.) A white micro-crystalline powder, prepared by interaction of sodium carbonate and calcium chloride.

Antacid and mildly Astringent. Dose—10 to 60 grs.

IN—Trochiscus Bismuthi Co., 4 grs. in each.

Calcii Chloridum (Calcium Chloride), $\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$.

In dry, white, very deliquescent masses, prepared by neutralising hydrochloric acid with calcium carbonate carefully desiccated at a temperature not exceeding 392°F .

Used for increasing the coagulability of the blood in hæmorrhages. Dose—5 to 15 grs.

Should not be confounded with the so-called chloride of lime.

Calcii Hypophosphis (Calcium Hypophosphite), $\text{Ca}(\text{PH}_2\text{O}_2)_2$.

A white, pearly, crystalline salt, prepared by interaction of phosphorus, calcium hydroxide, and water.

Nervine and Blood Tonic. Dose—3 to 10 grs.

Calcii Phosphas (Calcium Phosphate), $\text{Ca}_3(\text{PO}_4)_2$.

A light white amorphous powder, insoluble in water, prepared by dissolving bone ash in diluted hydrochloric acid and adding diluted solution of ammonia, washing and drying the precipitate at a temperature not exceeding 212°F ., or by the interaction of calcium chloride and sodium phosphate.

Nervine and Blood Tonic. Dose—5 to 15 grs.

IN—Pulv. Antimonialis and Ext. Euonymi Sic.

Syrupus Calcii Lactophosphatis (Syrup of Calcium Lactophosphate).

Prepared by dissolving precipitated calcium carbonate $2\frac{1}{2}$ ozs. in lactic acid 6 ozs., with water 24 ozs., adding concentrated phosphoric acid 4 ozs. and 262 mins., triturating until the precipitate formed is dissolved, adding a little water, filtering, and adding orange-flower water, undiluted, $2\frac{1}{2}$ ozs., and dissolving, without heat, in the filtrate, sugar 70 ozs., and adding water to make 5 pints.

Dose— $\frac{1}{2}$ to 1 dr. Action similar to phosphate.

CALX (Lime), CaO .

Calcium oxide in compact whitish masses, obtained by calcining chalk, limestone, or marble.

Caustic. Not used internally.

Calcii Hydras (Calcium Hydroxide), $\text{Ca}(\text{HO})_2$.

(Synonym—Slaked Lime.)

A white powder, prepared by the interaction of water and calcium oxide. It acts like Calx.

Used in the preparation of Liq. Ext. of Ipecacuanha, Chloroform, etc.

Liquor Calcis (Solution of Lime), $\frac{1}{2}$ gr. in 1 oz.

(Synonym—Lime Water.) Prepared by washing slaked lime 2 ozs., adding water 1 gallon, and after standing for twelve hours, syphoning off the clear colourless liquid.

Antacid and Astringent.

Dose—1 to 4 ozs. in milk; $\frac{1}{2}$ to 1 dr. for a child 1 year old.

Used in the preparation of Argenti Oxid., Lotio Hydrarg. Flava, Lotio Hydrarg. Nigra.

Linimentum Calcis, 1 in 2.

Lime water and olive oil, of each 2 ozs. (mixed), forming a thick whitish emulsion, known as Carron Oil.

Sedative application to burns and scalds.

☞ The original Carron oil was made with Linseed oil.

Liquor Calcis Saccharatus, 8 grs. in 1 oz.

(Saccharated Solution of Lime.) Prepared by adding 1 oz. calcium hydroxide and 2 ozs. sugar to water 1 pint, mixing and syphoning.

Same as Liquor Calcis in action. Dose—20 to 60 mins.

Calx Chlorinata (Chlorinated Lime).

A dull white powder, obtained by exposing slaked lime to the action of chlorine gas until absorption ceases. It is known as bleaching powder and as chloride of lime. It has bleaching and disinfecting properties, and is astringent.

Used in the preparation of Chloroform.

Liquor Calcis Chlorinatæ, 1 lb. to 1 gal.

A colourless filtered solution of chlorinated lime in water.

Antiseptic. Yields, when fresh, 3 per cent. Cl.

Chiefly used as a Deodoriser.

Calx Sulphurata (Sulphurated Lime).

A greyish-white, foul-smelling powder, containing not less than 50 per cent. of calcium sulphide (CaS) with calcium sulphate and carbon, prepared by reducing native calcium sulphate by carbon.

Antisuppurative. Dose— $\frac{1}{4}$ to 1 grain in pill.

CALUMBÆ RADIX (Calumba Root)—Menispermaceæ.

The dried transversely cut root (in round or oval irregular flat yellow slices, depressed towards the centre) of *Jateorhiza Columba*.

Active principles—Calumbin and Berberine.

A Bitter Tonic. Dose—5 to 20 grs. in powder.

Infusum Calumbæ, 1 in 20 ($\frac{1}{2}$ hour).

1 oz. calumba root macerated in 1 pint of *cold* water.

Dose— $\frac{1}{2}$ to 1 oz.

Liquor Calumbæ Concentratus, 1 in 2.

It is prepared thus:—Macerate 10 ozs. calumba root for 24 hours in 10 ozs. water; press and again macerate for 24 hours in 10 ozs. water; press and mix the expressed liquids, and heat for 5 minutes to 180° F. When cold add 4 $\frac{1}{2}$ ozs. alcohol (90 per cent.). Decant or filter after standing. Product, 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

Tinctura Calumbæ, 1 in 10.

A greenish-brown liquid, prepared by macerating 2 ozs. calumba root in 1 pint alcohol (60 per cent.).

Dose— $\frac{1}{2}$ to 1 dr.

As calumba root and its preparations do not contain any tannin they can, like quassia, be prescribed with all the preparations of iron. Cold water is used in making the infusion, lest any of the starch should be extracted.

CAMBOGIA (Gamboge)—Guttiferæ.

A gum-resin in reddish-yellow cylindrical pieces, longitudinally striated on the surface, obtained from *Garcinia Hanburii*.

Active ingredient—Cambogic Acid.

A Hydragogue and Drastic Cathartic. Dose— $\frac{1}{2}$ to 2 grs. in pill.

Pilula Cambogiæ Composita, 1 in 6.

Composed of gamboge, Barbados aloes, compound cinnamon powder, of each 1 oz.; hard soap, 2 ozs.; syrup of glucose, 1 oz.

Hydragogue Cathartic. Dose—4 to 8 grs.

CAMPHORA (Camphor)—Lauraceæ.

A stearoptene or volatile oil, in translucent, white, crystalline lumps, rectangular tablets, or pulverulent masses, obtained from *Cinnamomum Camphora*, purified by sublimation.

Stimulant and Antispasmodic. Dose—2 to 5 grs.

In addition to the preparations bearing the name, camphor enters into Ungt. Hydrarg. Co., and into 11 of the 15 liniments of the Pharmacopœia.

Aqua Camphoræ, $\frac{1}{2}$ gr. in 1 oz.

Prepared by dissolving 70 grs. camphor in alcohol (90 per cent.) q.s. to make $\frac{1}{2}$ oz., and adding gradually to 1 gall. water.

Only a vehicle for more active remedies.

Linimentum Camphoræ, 1 in 5 nearly.

(Synonym—Camphorated Oil.)

A yellow, oily liquid, prepared by dissolving 1 oz. camphor in 4 ozs. olive oil.

A Stimulating Application in chronic painful affections.

In—Lin. Chlorof., Lin. Hydrarg., and Lin. Tereb. Acet.

Linimentum Camphoræ Ammoniatum, 1 in 8.

(Synonym—Compound Liniment of Camphor.)

A faintly-yellowish liquid, prepared by dissolving $2\frac{1}{2}$ ozs. camphor and 1 dr. oil of lavender in 12 ozs. alcohol (90 per cent.), and adding 5 ozs. strong solution of ammonia and sufficient alcohol (90 per cent.) to make 1 pint.

A safe and effectual Rubefacient and Counter-irritant.

In absence of other remedies, it may be used as a general diffusible stimulant in 20 minim doses, largely diluted.

Spiritus Camphoræ, 1 in 10.

Prepared by dissolving 1 oz. camphor in alcohol (90 per cent.) to 10 ozs.

Dose—5 to 20 mins. in emulsion.

Tinctura Camphoræ Composita, $1\frac{1}{2}$ grs. camphor and the equivalent of 2 grs. opium in 1 oz.

(Synonyms—Paregoric ; Paregoric Elixir.)

A sherry-coloured liquid, prepared by dissolving 585 mins. tincture of opium, 40 grs. benzoic acid, 30 grs. camphor, and 30 mins. oil of anise, in alcohol (60 per cent.) to make 1 pint.

Narcotic and Expectorant. Dose— $\frac{1}{2}$ to 1 dr.

CANNABIS INDICA (Indian Hemp)—Cannabinaceæ.

The dried flowering or fruiting tops of the female plant of *Cannabis sativa*, from which the resin has not been removed, grown in India ; in elongated compressed bundles of a dusky-green colour, in which may be recognised the flowers, young branches, smaller leaves, and the well-known fruits commonly called hemp seeds. (Known in India as Gunjah or Ganga.)

Active principle—crude Cannabinol—a red oil, a resin, and other substances.

Anodyne and Narcotic.

Extractum Cannabis Indicæ.

A rich green resinous extract, prepared from the tops by percolation with alcohol (90 per cent.), and evaporating the tincture thus formed.

Anodyne and Narcotic, like Opium. Dose— $\frac{1}{4}$ to 1 gr.

Tinctura Cannabis Indicæ, 1 in 20.

A deep green liquid, prepared by dissolving 1 oz. of the extract in alcohol (90 per cent.) q.s. to 1 pint.

Dose—5 to 15 mins., in mucilage or wine.

IN—Tr. Chlorof. et Morphinæ Co.

CANTHARIS (Cantharides)—Coleoptera.

The dried beetle *Cantharis vesicatoria*, about $\frac{3}{4}$ to 1 inch long, with bright metallic green wing covers; the powder is greyish-brown, with shining green particles.

Active principle—Cantharidin.

Vesicant, or Epispastic, Counter-Irritant, and Diuretic.

Acetum Cantharidis, 1 in 10.

A dark brown coloured liquid, prepared from 2 ozs. cantharides by percolation with equal parts water and glacial acetic acid, to produce 1 pint.

Epispastic. Not used internally.

Emplastrum Cantharidis, 1 in 3 nearly.

A brownish substance, of the consistence of firm ointment, showing dark green shining particles, prepared by heating $3\frac{1}{2}$ ozs. cantharides (in powder), 2 ozs. each yellow beeswax, resin, and lard, and $\frac{1}{2}$ oz. soap plaster. Known as blistering plaster.

Vesicant. Generally blisters in from 6 to 9 hours.

Emplastrum Calefaciens, 1 in 24. (Warming plaster.)

Prepared by adding to a strong infusion of 4 ozs. of cantharides 4 ozs. each yellow beeswax and resin, $3\frac{1}{4}$ lbs. resin plaster, and 2 lbs. soap plaster previously heated, mixing and making a firm plaster of a yellow colour.

A stimulating application, and known also as Warm Plaster.

Tinctura Cantharidis, 1 in 80.

A pale straw-coloured liquid, prepared by macerating $\frac{1}{4}$ oz. cantharides in 1 pint alcohol (90 per cent.).

Diuretic and Stimulant to the genito-urinary organs.

Dose—5 to 15 mins.; if frequently repeated, 2 to 5 mins.

Unguentum Cantharidis, 1 to 10.

An ointment of a yellowish-brown colour, prepared by digesting at 120° F. for 12 hours 1 oz. cantharides in 10 ozs. benzoated lard and straining.

Rubefacient. Milder than Emplastrum Cantharidis.

Collodium Vesicans (Blistering Collodion).

A thick liquid, prepared by adding $\frac{1}{2}$ oz. pyroxylin to 20 ozs. blistering liquid.

Vesicant, like the Emplastrum and the following :—

Liquor Epispasticus (Blistering Liquid), 1 in 2.

A bright greenish-brown, ethereal liquid, prepared by percolating 10 ozs. cantharides with acetic ether to make 1 pint.

CAOUTCHOUC (India-Rubber)—Euphorbiaceæ.

Elastic masses, of varying thickness, being the prepared milk juice of *Hevea brasiliensis* and probably other species. Known in commerce as pure Para rubber.

Liquor Caoutchouc, 1 in 20.

A thickish fluid, made by dissolving India-rubber 1 oz. in a mixture of 10 ozs. each benzol and carbon bisulphide.

Used in making Charta Sinapis.

CAPSICI FRUCTUS (Capsicum)—Solanaceæ.

A small oblong orange-coloured pod, containing flat white seeds, the fruit of *Capsicum minimum*, known as Cayenne pepper.

Active principles—Capsaicin and Capsicine.

A powerful Stimulant and Rubefacient, without blistering.

Dose— $\frac{1}{2}$ to 1 gr. 30 grs. in Delirium Tremens.

Tinctura Capsici, 1 in 20.

A brandy-coloured liquid, prepared by macerating 1 oz. capsicum fruit in 1 pint alcohol (70 per cent.).

Dose—5 to 15 mins. diluted.

IN—Tr. Chlorof. et Morphinæ Co.

Unguentum Capsici, 1 to 4 nearly.

A reddish-coloured ointment, made by warming on a water-bath for 1 hour 120 grs. capsicum fruit with 60 grs. spermaceti and 1 oz. olive oil, and straining. (Known as Chili paste.)

Rubefacient.

CARBO LIGNI (Wood Charcoal).

A black powder free from grittiness, prepared by charring wood to a red heat without access of air.

Deodoriser and Absorbent in fetid eructations.

Dose—60 to 120 grs. ; or, sprinkled over foul sores.

CARBONIS BISULPHIDUM (Carbon Bisulphide), CS₂.

(Synonym—Carbon Disulphide.) A colourless, highly refractive, stinking liquid, prepared by combining carbon and sulphur at a high temperature, condensing and purifying.

Used in preparing Liquor Caoutchouc and Pil. Phosphori.

CARDAMOMI SEMINA (Cardamoms)—Zingiberaceæ.

The small, dried, ripe angular brown seeds of *Elettaria Cardamomum*, kept in their triangular pericarps till required.

Carminative and Antispasmodic. Dose—5 to 20 grs.

Tinctura Cardamomi Composita, 1 in 80.

A deep red liquid, prepared by macerating $\frac{1}{4}$ oz. each cardamom seeds and caraway fruit, 2 ozs. raisins, $\frac{1}{2}$ oz. cinnamon, 55 grs. cochineal, in 1 pint alcohol (60 per cent.).

Carminative and colouring agent. Dose— $\frac{1}{2}$ to 1 dr.

In addition to the Tincture, cardamom seeds enter into the following :—Ext. Col. Co., Pulv. Cinnam. Co., Pulv. Cretæ Arom., Tr. Gent. Co., Tr. Rhei Co.; and the Tincture itself enters into Dec. Aloes Co. and Mist. Sennæ Co.

CARUI FRUCTUS (Caraway Fruit)—Umbelliferæ.

The minute brown aromatic seed-like dried fruits, with usually separate mericarps, of *Carum Carvi*, tapering at each end, and marked with five ridges.

Carminative, Stimulant, and Antispasmodic.

IN—Confect. Piperis, Pulv. Opii Co., Tr. Card. Co., and Tr. Sennæ Co.

Aqua Carui, 1 lb. to 1 gallon.

A colourless water, prepared by distilling 1 gall. of water from 1 lb. of caraway fruit, and 2 galls. of water.

Oleum Carui.

The faint yellow oil distilled from caraway fruit.

Dose— $\frac{1}{2}$ to 3 mins., on sugar.

IN—Pilula Aloes Barb.

CARYOPHYLLUM (Cloves)—Myrtaceæ.

The dried unexpanded fragrant flower buds of *Eugenia caryophyllata*, with a spherical head, cylindrical body, and four teeth, the latter parts constituting the calyx tube.

Carminative, Stimulating Aromatic, and Tonic.

IN—Infus. Aurant. Co. and Pulv. Cretæ Ar.

Infusum Caryophylli, 1 in 40 ($\frac{1}{4}$ hour).

Prepared by infusing $\frac{1}{2}$ oz. cloves in 1 pint boiling water.

Dose— $\frac{1}{2}$ to 1 oz.

Oleum Caryophylli.

The clear colourless or yellowish oil distilled from cloves.

Antispasmodic, Stimulant, and powerfully Antiseptic.

Dose— $\frac{1}{2}$ to 3 mins., on sugar. Active principle is Eugenol.

IN—Pil. Col. Co., and Pil. Col. et Hyos.

CASCARA SAGRADA (Cascara Sagrada)—Rhamnaceæ.

(Synonyms—Rhamni Purshiani Cortex ; Sacred Bark.)

The nearly smooth, dark purplish-brown, quilled, channelled or nearly flat, transversely marked dried bark of *Rhamnus purshianus*. It is usually more or less covered with silvery-grey lichen.

Active principle — An Anthracene body — Anthra-glucosagradin. Cathartic, acting on the entire intestinal tract.

Extractum Cascaræ Sagradæ.

(Synonym—Extractum Rhamni Purshiani).

A *solid* extract, prepared by percolating cascara sagrada with water, and evaporating the resulting liquid to dryness.

Dose—2 to 8 grs., in pill.

Extractum Cascaræ Sagradæ Liquidum, 1 in 1.

(Synonym—Extractum Rhamni Purshiani Liquidum.) An almost black liquid, prepared by exhausting 20 ozs. of cascara sagrada by percolation with distilled water, evaporating the percolate to 12 ozs., and adding 4 ozs. alcohol (90 per cent.) and water q.s. to 1 pint.

Cathartic, Tonic, and Cholagogue. Dose— $\frac{1}{2}$ to 1 dr.

Syrupus Cascaræ Aromaticus, 1 in 2 $\frac{1}{2}$.

Made by mixing 8 ozs. liquid extract of cascara sagrada, 2 ozs. tincture of orange, 1 oz. alcohol (90 per cent.), 3 ozs. cinnamon water, and 6 ozs. syrup.

Stomachic Tonic and Laxative. Dose— $\frac{1}{2}$ to 2 drs.

CASCARILLA (Cascarilla)—Euphorbiaceæ.

The dried bark of *Croton Eluteria* in small, dull brown quills (coated with lichens) covered with a brown separable corky layer, with a warm taste and aromatic odour.

Active principle—Cascarillin.

An Aromatic Bitter Tonic.

Infusum Cascarillæ, 1 in 20 ($\frac{1}{4}$ hour).

Prepared by infusing 1 oz. cascarilla in 1 pint boiling water.

Dose— $\frac{1}{2}$ to 1 oz.

Tinctura Cascarillæ, 1 in 5.

A dark brown liquid, prepared by percolating 4 ozs. of powdered cascarilla with 1 pint alcohol (70 per cent.).

Dose— $\frac{1}{2}$ to 1 dr. diluted.

CASSIÆ PULPA (Cassia Pulp).—Leguminosæ.

The soft, sweet, nearly black pulp obtained from the pods of *Cassia Fistula*. Pods are 1 $\frac{1}{2}$ to 2 feet long.

Laxative. Used as an adjuvans to senna in *Confectio Sennæ*.

CATECHU (Catechu)—Cinchonaceæ.

(Synonym—Catechu Pallidum.)

An extract of the leaves and young shoots of *Uncaria Gambier* in porous or friable hard cubes (1 inch each side), reddish-brown externally, cinnamon-brown internally.

Active principles—Catechutannic Acid and Catechin.

A Tonic Astringent. Dose—5 to 15 grs., in powder.

Pulvis Catechu Compositus, 1 in $2\frac{1}{2}$.

A reddish-brown powder, consisting of catechu, 4 ozs. ; kino and krameria root, of each 2 ozs. ; cinnamon and nutmeg, of each 1 oz.

A Tonic Astringent in chronic diarrhœa.

Dose—10 to 40 grs. ; for a child 1 year old, 2 to 5 grs.

Tinctura Catechu, 1 in 5.

A rich coffee-brown liquid, prepared by macerating 4 ozs. of catechu and 1 oz. cinnamon in 1 pint alcohol (60 per cent.).

Dose— $\frac{1}{2}$ to 1 dr. 5 to 10 mins. for a child 1 year old.

Trochiscus Catechu, 1 gr. in each lozenge.

Brownish lozenges, consisting of catechu, with simple basis.

Local Astringent for relaxed throat.

CERA ALBA (White Beeswax).

Yellow beeswax bleached by exposure to moisture, air, and light ; in nearly white translucent masses or cakes.

IN—Pil. Phosphori, Suppositoria Ac. Carbolici, Ungt. Cetacei, and Ungt. Aq. Rosæ.

CERA FLAVA (Yellow Beeswax)—Hymenoptera.

Prepared from the honeycomb of the Hive Bee, *Apis mellifica*, in firm yellow masses ; not unctuous to the touch, melts at 144.5° to 147° F.

Used chiefly as a basis for ointments and plasters.

It enters into 4 ointments and 4 plasters.

CERII OXALAS (Cerium Oxalate), $\text{Ce}_2(\text{C}_2\text{O}_4)_3 \cdot 9\text{H}_2\text{O}$.

A white granular powder, obtained by the interaction of a soluble cerium salt and a soluble oxalate. It usually contains lanthanum and didymium oxalates.

A Gastric Sedative like bismuth ; given in the vomiting of pregnancy. Dose—2 to 10 grs. in a pill, or as a powder.

CETACEUM (Spermaceti).

A concrete fatty substance, in pearly, lustrous masses, obtained, mixed with oil, from the head of the Sperm whale

(Physeter macrocephalus), and separated from oil by filtration and pressure, and afterwards purified.

Internally, Demulcent ; externally, Emollient.

IN—Ungt. Capsici, and Ungt. Aq. Rosæ.

Unguentum Cetacei, 1 in 5.

A pearly-white ointment, prepared by heating for 2 hours 20 ozs. spermaceti, 8 ozs. white beeswax, 72 ozs. almond oil, and 2 ozs. benzoin, straining and stirring till cold.

An Emollient dressing for sores and blisters.

CHIRATA (Chiretta)—Gentianaceæ.

The dried plant, *Swertia Chirata*, collected when in flower. The unbranched root is 3 inches, and the stems are 3 feet long, about the size of goose quills, with opposite branches and paniced flowers. The drug is imported in compact bundles about 1 yard in length, bound round with bamboo strips.

Active principles—Ophelic Acid and Chiratin.

A pure bitter Tonic like gentian.

Infusum Chiratæ, 1 in 20 ($\frac{1}{4}$ hour).

Prepared by infusing 1 oz. chiretta in 1 pint boiling water.

Dose— $\frac{1}{2}$ to 1 oz.

Liquor Chiratæ Concentratus, 1 in 2.

Made by percolating 10 ozs. powdered chiretta with 25 ozs. alcohol (20 per cent.) to produce 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

Tinctura Chiratæ, 1 in 10.

A tea-coloured liquid, prepared by percolating 2 ozs. chiretta with alcohol (60 per cent.) to 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

CHLORAL HYDRAS (Chloral Hydrate), $\text{CCl}_3\text{CH}(\text{OH})_2$.

Trichlorethylidene glycol in colourless crystals, obtained by adding water to liquid chloral produced by the action of dry chlorine gas on ethylic alcohol.

Hypnotic and Sedative. Dose—5 to 20 grs.

Syrupus Chloral, 10 grs. in 1 dr.

A colourless syrup, prepared by dissolving 1,600 grs. chloral hydrate in 30 drs. water, and adding syrup to 1 pint.

Dose— $\frac{1}{2}$ to 2 drs.

CHLOROFORMUM (Chloroform), CHCl_3 .

Trichloromethane. A limpid, colourless liquid, prepared by heating ethylic alcohol, water, slaked lime, and chlorinated

lime. Sufficient absolute alcohol is added to give S.G. 1.490 to 1.495.

General Anæsthetic when inhaled ; Gastric Sedative when swallowed.

Dose—1 to 5 mins. Externally, Rubefacient and Anodyne.

Aqua Chloroformi, 1 in 400.

A solution of 30 mins. chloroform in 25 ozs. of water.

Used chiefly as a vehicle. Dose— $\frac{1}{2}$ to 2 ozs.

Linimentum Chloroformi, 1 in 2.

A pale yellow liquid, prepared by mixing 2 ozs. each chloroform and liniment of camphor.

Rubefacient and Anodyne.

Spiritus Chloroformi (Spirit of Chloroform), 1 in 20.

(Synonyms—Chloric Ether ; Spirit of Chloric Ether.)

1 oz. chloroform in alcohol (90 per cent.) to make 1 pint.

Dose—5 to 20 mins. for repeated administration ; single dose 30 to 40 mins., in water.

Tinctura Chloroformi et Morphinæ Composita, about 1 in 13.

Introduced as a substitute for Chlorodyne, which it somewhat resembles. It is a thin greenish liquid consisting of $1\frac{1}{2}$ ozs. chloroform, $87\frac{1}{2}$ grs. morphine hydrochloride, 1 oz. diluted hydrocyanic acid, $\frac{1}{2}$ oz. tincture of capsicum, 2 ozs. tincture of Indian hemp, 14 mins. oil of peppermint, 5 ozs. glycerin, and alcohol (90 per cent.) q.s. to make 1 pint.

Narcotic, Anodyne, and Antispasmodic. Dose—5 to 15 mins.

10 mins. contain $\frac{3}{4}$ min. chloroform, $\frac{1}{11}$ gr. morphine, $\frac{1}{2}$ min. dilute hydrocyanic acid, and 1 min. tincture of Indian hemp.

CHRYSAROBINUM (Chrysarobin).

A crystalline yellow powder, obtained from Araroba by extracting with hot chloroform, evaporating to dryness and powdering. Consists chiefly of a definite chemical substance also known as chrysarobin, but contains a varying proportion of chrysophanic acid.

Antiparasitic in skin diseases.

Unguentum Chrysarobini, 1 in 25.

A yellowish ointment, prepared by dissolving with heat 20 grs. chrysarobin in 480 grs. benzoated lard.

Antiparasitic and Stimulating application in psoriasis.

CIMICIFUGÆ RHIZOMA (Cimicifuga)—Ranunculaceæ.

(Synonym—Actææ Racemosæ Radix.) The dried, brownish-black, flattened cylindrical rhizome, and small, wiry, brittle branched rootlets of *Cimicifuga racemosa*.

Tonic, Expectorant, and Antirheumatic.

Extractum Cimicifugæ Liquidum, 1 in 1.

(Synonym—Liquid Extract of *Actæa Racemosa*.)

Prepared by exhausting by percolation 20 ozs. *cimicifuga* with alcohol (90 per cent.), and dissolving in the first 15 ozs. of percolate the extract obtained by evaporating the remainder, and making up to 1 pint with alcohol (90 per cent.).

Dose—5 to 30 mins.

Tinctura Cimicifugæ, 1 in 10.

(Synonym—Tincture of *Actæa Racemosa*.)

Prepared by percolating 2 ozs. *cimicifuga* (in No. 40 powder) with alcohol (60 per cent.) to make 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

CINCHONÆ RUBRÆ CORTEX (Red Cinchona Bark)—Cinchonaceæ.

The dried bark of the stem and branches of *cultivated* plants of *Cinchona succirubra*, in quills or incurved pieces, coated with periderm; bark itself $\frac{1}{10}$ to $\frac{1}{4}$ inch thick, outer surface roughened by fissures, cracks, and warts, and brownish-red; inner surface brick red. It should yield between 5 and 6 per cent. of total alkaloids, of which not less than half should consist of quinine and cinchonidine.

The bark contains 31 alkaloids, but only the following are used—Quinine, Quinidine, Cinchonine, and Cinchonidine.

Antiperiodic, Tonic, Antipyretic, and Astringent.

Extractum Cinchonæ Liquidum, 5 per cent. alkaloids.

A brownish liquid, prepared by exhausting 20 ozs. red cinchona bark with hydrochloric acid, glycerin, and water, and evaporating to 1 pint, determining the alkaloidal strength of this and by evaporating further, or adding water and alcohol (90 per cent.), making the finished liquid contain 5 grs. of alkaloids in every 110 minims. 1 oz. will nearly represent 1 oz. bark.

Dose—5 to 15 mins.

Infusum Cinchonæ Acidum, 1 in 20 (1 hour).

Prepared by infusing for one hour 1 oz. red cinchona bark (in No. 40 powder) and 2 drs. aromatic sulphuric acid in 1 pint boiling water.

Dose— $\frac{1}{2}$ to 1 oz.

Tinctura Cinchonæ, 1 per cent. alkaloids.

A reddish-brown liquid, prepared by percolating 4 ozs. red cinchona bark (in No. 40 powder) with alcohol (70 per cent.) so that it will contain 1 per cent. alkaloids.

Dose— $\frac{1}{2}$ to 1 dr.

Tinctura Cinchonæ Composita, $\frac{1}{2}$ per cent. alkaloids.

A reddish liquid, prepared by macerating 1 oz. dried bitter-orange peel, $\frac{1}{2}$ oz. serpentary rhizome, 55 grs. saffron, and 28 grs. cochineal in 10 ozs. alcohol (70 per cent.), and adding resulting tincture to 10 ozs. tincture of cinchona.

Tonic and Astringent. Dose— $\frac{1}{2}$ to 1 dr.

CINNAMOMI CORTEX (Cinnamon Bark)—Lauraceæ.

In light, yellowish-brown, closely-rolled, very thin, splintery quills, being the dried inner bark of shoots from the truncated stocks of cultivated *Cinnamomum zeylanicum* from Ceylon, and known as Ceylon Cinnamon.

Carminative and Stomachic.

Aqua Cinnamomi, 1 in 10.

A colourless water, prepared by distilling 1 gall. from 1 lb. cinnamon bark and 2 galls. water.

Dose—1 to 2 ozs.

IN—Mist. Cretæ, Mist. Guaiaci, Mist. Ol. Ricini, Mist. Spt. Vini Gallici, Syr. Aromat., and Syr. Cascaræ Aromat.

Oleum Cinnamomi.

The oil distilled from cinnamon bark ; yellowish when recent, but gradually becoming reddish. Its chief constituents are cinnamic aldehyde and acid and some eugenol.

Dose— $\frac{1}{2}$ to 3 mins., on sugar or in mucilage.

Spiritus Cinnamomi, 1 in 10.

1 oz. oil of cinnamon and alcohol (90 per cent.) to make 10 ozs.

Dose—5 to 20 mins.

IN—Acid. Sulphuric. Aromat.

Pulvis Cinnamomi Compositus, 1 in 3.

(Synonym—*Pulvis Aromaticus*.) A pale brown powder, consisting of cinnamon, cardamoms, and ginger—of each 1 oz.

Dose—10 to 40 grs.

IN—Pil. Aloes et Ferri and Pil. Cambogiæ Co.

Tinctura Cinnamomi, 1 in 5.

A reddish-brown liquid, prepared by percolating 4 ozs. of cinnamon with alcohol (70 per cent.) to 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.; for a child 1 year old 5 mins. on sugar.

Cinnamon also enters into Decoct. Hæmatoxyli, 3 powders—*i.e.*, catechu, kino, chalk—and 3 tinctures—*i.e.*, cardamoms, catechu, and lavender.

COCÆ FOLIA (Coca Leaves)—Erythroxylaceæ.

The smooth, dried, green, oval leaves of *Erythroxylum Coca* and its varieties, shortly stalked, and with faint tea-like odour. A line is generally visible on either side of the midrib on the under surface of the leaf, especially in the Bolivian variety. Active principles—Cocaine and other allied alkaloids, and Hygrine. Chemically, cocaine may be regarded as methyl-benzoyl-ecgonine.

Tonic and Restorative.

Extractum Cocæ Liquidum, 1 in 1.

A brown liquid, prepared by exhausting 20 ozs. coca leaves with alcohol (60 per cent.), and proceeding as for Ext. Cimicif. Liq. to produce 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

Cocainæ (Cocaine), $C_{17}H_{21}NO_4$ (*i.e.*, methyl-benzoyl-ecgonine).

An alkaloid in colourless prisms, almost insoluble in water, soluble in alcohol, ether, chloroform, and olive oil, obtained from *Erythroxylum Coca* and its varieties.

Local Anæsthetic.

Unguentum Cocainæ, 1 in 25.

A faintly yellow ointment, prepared by dissolving 20 grs. cocaine in 80 grs. oleic acid, and mixing with lard 400 grs.

Cocainæ Hydrochloridum (Cocaine Hydrochloride)—Hydrochlorate of Cocaine, B.P., 1885. $C_{17}H_{21}NO_4.HCl$.

The hydrochloride of an alkaloid in colourless acicular crystals, obtained from *Erythroxylum Coca* and its varieties.

Local Anæsthetic and Mydriatic. Dose— $\frac{1}{5}$ to $\frac{1}{2}$ gr.

Injectio Cocainæ Hypodermica (Hypodermic Injection of Cocaine), 10 grs. in 110 mins. (*i.e.*, 10 per cent.).

Made by dissolving 33 grs. cocaine hydrochloride in a solution of $\frac{1}{2}$ gr. salicylic acid in 6 drs. boiling distilled water which has been allowed to cool.

Dose—By subcutaneous injection 2 to 5 mins.

Lamellæ Cocainæ (Discs of Cocaine).

Discs of gelatin with some glycerin, each weighing about $\frac{1}{30}$ gr., and containing $\frac{1}{30}$ gr. of cocaine hydrochloride.

Trochiscus Kramerie et Cocainæ, 1 gr. and $\frac{1}{20}$ gr. in each.

(Synonym—Rhatany and Cocaine Lozenge.) Made to contain extract of *krameria* 1 gr. and cocaine hydrochloride $\frac{1}{20}$ gr. with fruit basis.

Astringent and Anæsthetic.

COCCUS (Cochineal)—Hemiptera.

The wrinkled, oval, dried fecundated female insect, *Coccus Cacti*, reared on *Nopalea coccinellifera* and other species of *Nopalea*. Used as a rich carmine-red, harmless colouring agent.

IN—Tr. Card. Co., Tr. Cinch. Co., and

Tinctura Cocci, 1 in 10.

A carmine-coloured liquid, prepared by macerating 2 ozs. powdered cochineal in 1 pint alcohol (45 per cent.). Used for colouring mixtures.

Dose—5 to 15 mins.

CODEINA (Codeine), $C_{17}H_{18}(CH_3)NO_3 \cdot H_2O$.

An alkaloid in colourless trimetric crystals, obtained from opium or morphine. (It is methyl-morphine.)

Hypnotic—resembling morphine—given in Diabetes. Dose— $\frac{1}{4}$ to 2 grs.

Codeinæ Phosphas (Codeine Phosphate).

$(C_{17}H_{18}(CH_3)NO_3 \cdot H_3PO_4)_2 \cdot 3H_2O$.

The phosphate of an alkaloid in white crystals, very soluble in water, obtained from opium or morphine.

Hypnotic. Dose— $\frac{1}{4}$ to 2 grs.

Syrupus Codeinæ (Syrup of Codeine), 1 in 240. $\frac{1}{4}$ gr. in dr.

A colourless syrup, obtained by dissolving 40 grs. codeine phosphate in $\frac{1}{4}$ oz. water and mixing with $19\frac{3}{4}$ ozs. syrup.

Dose— $\frac{1}{2}$ to 2 drs.

COLCHICI CORMUS (*Colchicum Corm*)—Melanthaceæ.

The *fresh* corm (about the size of a chestnut) of *Colchicum autumnale*—meadow saffron, and the same stripped of its coats, in thin, white, *dried*, kidney-shaped slices. Collected in early summer.

Active principles—Colchicine and Colchiceine.

Diuretic and Purgative—used in Gout. Dose—2 to 5 grs.

Extractum Colchici.

A soft, brownish-black extract, prepared by heating the juice of the *fresh* corm to 212° , straining, and evaporating under 160° .

Dose— $\frac{1}{4}$ to 1 gr., in pill.

Vinum Colchici, 1 in 5.

A slightly muddy, tea-coloured liquid, prepared by macerating 4 ozs. *dried* colchicum corm in 1 pint sherry.

Dose—10 to 30 mins.

COLCHICI SEMINA (Colchicum Seeds)—Melanthaceæ.

The small, hard, globular reddish-brown dried ripe seeds of *Colchicum autumnale*.

Active principles—Colchicine and Colchiceine.

Action like the corm.

Tinctura Colchici Seminum, 1 in 5.

A brown, sherry-coloured liquid, prepared by percolating 4 ozs. colchicum seeds with alcohol (45 per cent.) to make 1 pint.

Dose—5 to 15 mins.

COLLODIUM (Collodion), 1 in 48.

A colourless syrupy liquid, consisting of a solution of 1 oz. pyroxylin in 36 ozs. ether and 12 ozs. alcohol (90 per cent.).

Protective to wounds.

Collodium Flexile (Flexible Collodion).

A colourless syrupy liquid, prepared by mixing $\frac{1}{2}$ oz. Canada turpentine, $\frac{1}{4}$ oz. castor oil, and 12 ozs. collodion.

Acts like collodion, but less liable to crack on drying.

Collodium Vesicans (Blistering Collodion).

A thick liquid, consisting of $\frac{1}{2}$ oz. pyroxylin and 20 ozs. blistering liquid. (See under *Cantharides*.)

Acts like cantharides plaster.

COLOCYNTHIDIS PULPA (Colocynth Pulp)—Cucurbitaceæ.

The peeled, dried, spongy, light pulp of the fruit of *Citrullus Colocynthis*—the bitter apple—in broken white balls, the seeds (resembling apple-pips) being rejected.

Active principle—Colocynthin (a glucoside).

A Drastic Cathartic.

Extractum Colocynthidis Compositum, 1 in $4\frac{1}{2}$ (nearly).

A firm, blackish mass, prepared by exhausting 6 ozs. colocynth pulp with 1 gall. alcohol (60 per cent.), and, after the alcohol is distilled from the resulting tincture, 12 ozs. extract of Barbados aloes, 4 ozs. resin of scammony, 4 ozs. curd soap, and 1 oz. cardamoms in fine powder, are added, and the evaporation continued till a firm consistence is reached. It is really a pill mass.

Purgative, like *Pil. Col. Co.* Dose—2 to 8 grs.

Pilula Colocynthidis Composita, 1 in 6.

Prepared by beating together 1 oz. powdered colocynth pulp, 2 ozs. each Barbados aloes and scammony resin, $\frac{1}{4}$ oz. potassium sulphate, and 2 drs. oil of cloves, with q.s. distilled water. Distinguished from the compound extract by the odour of cloves.

Dose—4 to 8 grs.

Pilula Colocynthis et Hyoscyami, 1 and 3 in 9.

1 oz. extract of hyoscyamus and 2 ozs. comp. colocynth pill.

Dose—4 to 8 grs. Not so liable to gripe as Pil. Col. Co.

CONII FOLIA (Conium Leaves)—Umbelliferæ.

*The finely-divided, smooth, *fresh* leaves and young branches of the Spotted Hemlock, *Conium maculatum*. Gathered when the fruit begins to form. The stems are smooth and marked with purple spots.

Active principles—Coniine, Methyl-coniine, and Conhydrine.

Anodyne, Narcotic, Sedative.

Succus Conii.

A brownish liquid, consisting of the juice of conium leaves and young branches, to which $\frac{1}{3}$ of alcohol (90 per cent.) is added.

Dose—1 to 2 drs.

Unguentum Conii, 2 of juice in 1.

A yellow ointment, prepared by evaporating 2 ozs. conium juice under 140° F. to $\frac{1}{8}$ its bulk, and mixing with $\frac{3}{4}$ oz. hydrous wool fat.

Local Anodyne in painful conditions of the rectum and anus.

This is the ointment first introduced by the writer, and now sanctioned by the B.P.

CONII FRUCTUS (Conium Fruit)—Umbelliferæ.

The dried, full-grown, unripe, small, seed-like, greyish fruits, usually consisting of separate mericarps, with 5 waved ridges, of *Conium maculatum*.

Active principles—as from leaves.

Action like the leaves.

Tinctura Conii, 1 in 5.

A brownish liquid, prepared by percolating 4 ozs. of the recently comminuted fruit with alcohol (70 per cent.) to 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

COPAIBA (Copaiba)—Leguminosæ. (Synonym—Copaiva.)

The thick, yellow, fluid oleo-resin, obtained from the trunk of *Copaifera Lansdorfii* and other *Copaifera*.

Stimulant to urinary and bronchial mucous surfaces.

Active ingredients—Ethereal Oil and Resin.

Dose— $\frac{1}{2}$ to 1 dr., in emulsion, capsules, or confection.

Oleum Copaibæ.

The colourless or pale yellow oil distilled from *Copaiba*.

Dose—5 to 20 mins., as above.

CORIANDRI FRUCTUS (Coriander Fruit)—Umbelliferae.

The small, globular, ribbed, yellowish-brown, dried, ripe, seed-like fruit of *Coriandrum sativum*. (The mericarps usually remain closely united.)

Antispasmodic and Carminative.

IN—Confect. Sennæ, Syr. Rhei, Tinct. Rhei Co., and Tinct. Sennæ Co.

Oleum Coriandri.

The yellowish oil distilled from the fruit.

Dose— $\frac{1}{2}$ to 3 mins., on sugar or in emulsion.

IN—Syrupus Sennæ.

CREOSOTUM (Creosote).

A colourless or pale yellow oily liquid, with a strong somewhat tarry odour, a product of the distillation of Wood Tar. It consists of a mixture of guaiacol, creosol, and other phenols.

Sedative, Astringent, and Antiseptic. Externally, Styptic.

Dose—1 to 5 mins., in pill or in capsules.

Mistura Creosoti, 1 min. in 1 oz.

A nearly colourless mixture, consisting of creosote and spirit of juniper, of each 16 mins., syrup 1 oz., and distilled water 15 ozs.

Dose— $\frac{1}{2}$ to 1 oz.

Unguentum Creosoti, 1 in 10.

A white ointment, prepared by melting together 1 oz. creosote, 4 ozs. hard paraffin, and 5 ozs. white soft paraffin, and stirring till cold.

CRETA PRÆPARATA (Prepared Chalk), CaCO_3 .

Native calcium carbonate in white friable masses or white powder, freed from its impurities by elutriation.

Antacid and Astringent. Dose—10 to 60 grs.

IN—Hydrarg. cum Creta 2 in 3, and in

Mistura Cretæ, 1 in 32.

A white milky mixture, prepared by rubbing up $\frac{1}{4}$ oz. prepared chalk, 15 grs. tragacanth, and $\frac{1}{2}$ oz. sugar in cinnamon water, q.s. to make 8 ozs.

Dose— $\frac{1}{2}$ to 1 oz. For a child 1 year old, 1 to 2 drs.

Pulvis Cretæ Aromaticus, 1 in 4 (nearly).

A pale brown powder, consisting of cinnamon 4 ozs., nutmeg 3 ozs., cloves $1\frac{1}{2}$ ozs., cardamoms 1 oz., sugar 25 ozs., chalk 11 ozs.

Astringent. Dose—10 to 60 grs.

Pulvis Cretæ Aromaticus cum Opio, 1 in 40 of opium.

A pale brown powder, prepared by mixing $9\frac{3}{4}$ ozs. of aromatic powder of chalk with $\frac{1}{4}$ oz. powdered opium.

Aromatic, Astringent, and Narcotic.

Dose—10 to 40 grs. ; for a child 1 year old, 1 gr.

CROCUS (Saffron)—Iridaceæ.

The dried stigmas and tops of the styles of *Crocus sativus*, each terminating in three orange-red stigmas, and measuring about 1 inch.

Supposed Emmenagogue ; only used for its colour.

IN—Decoct. Aloes Co. and Tinct. Cinch. Co.

Tinctura Croci, 1 in 20.

A bright yellowish-brown liquid, prepared by macerating 1 oz. saffron in 1 pint alcohol (60 per cent.).

Dose—5 to 15 mins.

CROTONIS OLEUM (Croton Oil)—from Euphorbiaceæ.

The viscid, brownish-yellow oil, with a faint disagreeable odour and burning taste, *expressed* from the seeds of *Croton Tiglium*.

Active principles—Crotonoleic Acid, and Croton-resin.

Hydragogue Cathartic, acts generally within one or two hours.

Dose— $\frac{1}{2}$ to 1 min., in pill, or on dry sugar, or mixed with butter.

Linimentum Crotonis, 1 in 8.

A green liquid, consisting of croton oil 1 oz., oil of cajuput and alcohol (90 per cent.), of each $3\frac{1}{2}$ ozs.

Rubefacient and Counter-irritant.

CUBEBAE FRUCTUS (Cubebs)—Piperaceæ.

The globular, dried, full-grown, unripe fruit of *Piper Cubeba*, about the size and colour of black pepper, with a stalk attached to it ; hence called tailed pepper.

Active ingredients—Ethereal Oil and Resinous Acids ; Cubebin is inert.

Diuretic and Expectorant.

Dose in gonorrhœa—30 to 60 grs.

Oleum Cubebæ.

A pale greenish-yellow or colourless oil, distilled from Cubebs.

Dose—5 to 20 mins., in emulsion with mucilage.

Tinctura Cubebæ, 1 in 5.

A brownish liquid prepared by percolating 4 ozs. cubebs with alcohol (90 per cent.) to make 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

CUPRI SULPHAS (Copper Sulphate)— $\text{CuSO}_4, 5\text{H}_2\text{O}$.

(Synonym—Cupric Sulphate.)

Brilliant blue crystalline triclinic prisms, obtained by interaction of water, sulphuric acid, and copper or cupric oxide.

Astringent, Tonic, Emetic, and Caustic.

Dose—As an Astringent, $\frac{1}{4}$ gr. to 2 grs., in pill; as an Emetic, 5 to 10 grs., in solution in water.**CUSPARIÆ CORTEX** (Cusparia Bark)—Rutaceæ.The straight, incurved pieces or quills, bevelled at the edges, with an external corky layer and mottled brown epidermis of *Cusparia febrifuga*. Known also as *Angostura Bark*.

Active ingredients—Cusparine and Volatile Oil.

Bitter Tonic.

Infusum Cuspariæ, 1 in 20 ($\frac{1}{4}$ hour).

1 oz. cusparia bark infused in 1 pint boiling water.

Dose—1 to 2 ozs.

Liquor Cuspariæ Concentratus, 1 in 2.

Prepared by percolating 1 pint of concentrated solution from 10 ozs. cusparia bark and 25 ozs. alcohol (20 per cent.).

Dose— $\frac{1}{2}$ to 1 dr.**CUSSO** (Kousso)—Rosaceæ.The dried panicles of the pistillate flowers of *Brayera anthelmintica* in compressed clusters or cylindrical rolls; the flowers are reddish-brown on hairy stalks, with calyx five-parted.

Active principle—Kosotoxin.

Anthelmintic for *tænia solium*. Dose— $\frac{1}{4}$ to $\frac{1}{2}$ oz. in fresh infusion.**DIGITALIS FOLIA** (Digitalis Leaves)—Scrophulariaceæ.The large, wrinkled, downy, dried leaves, from 4 to 12 inches long, with bluntly serrated edges, of *Digitalis purpurea* (Purple Foxglove). Collected from plants commencing to flower.

Active glucosides—Digitalin, Digitalein, Digitoxin, and Digitonin.

Diuretic and Cardiac Tonic. Dose— $\frac{1}{2}$ to 2 grs. in powder.**Infusum Digitalis**, 60 grs. to 1 pint ($\frac{1}{4}$ hour).

60 grs. digitalis leaf infused in 1 pint boiling distilled water.

Dose—2 to 4 drs.

Tinctura Digitalis, 1 in 8.A dark brown liquid, prepared by percolating 2 $\frac{1}{2}$ ozs. digitalis leaf with alcohol (60 per cent.) q.s. to 1 pint.

Dose—5 to 15 mins.

ELATERIUM (Elaterium)—from Cucurbitaceæ.

A sediment in thin, friable, greenish-grey, curved cakes, obtained from the juice of the fruit of *Ecballium Elaterium*.

Hydragogue Cathartic. Dose— $\frac{1}{10}$ to $\frac{1}{2}$ gr.

ELATERINUM (Elaterin), $C_{20}H_{28}O_5$.

A chemically neutral substance, being the active principle of elaterium, in small hexagonal tables.

A Drastic Hydragogue Cathartic. Dose— $\frac{1}{40}$ to $\frac{1}{10}$ gr.

Pulvis Elaterini Compositus, 1 in 40.

A white powder, consisting of elaterin 5 grs., rubbed up with milk sugar 195 grs.

Dose—1 to 4 grs., in pill or powder.

ERGOTA (Ergot)—Fungi and Graminaceæ.

Ergot is the spawn or sclerotium of *Claviceps purpurea*—a fungus attacking the ovary of *Secale cereale*; in long, dark violet-black, cylindrical, brittle grains, pinkish-white internally.

Active ingredients—Ergotoxine, Ergotinic or Sclerotic Acid, and Sphacelinic Acid or Sphacelotoxin. Cornutine does not exist as such in ergot, but is a decomposition product of a second alkaloid—Ergotinine—which is crystalline, but almost inert.

Emmenagogue. Acts on unstripped muscular fibre.

Dose—20 to 60 grs. Seldom, however, given in powder.

Extractum Ergotæ (Extract of Ergot). (Synonym—Ergotin.)

A soft extract, prepared by percolating ergot with alcohol (60 per cent.). Water is added to the evaporated product, which, when cold, is filtered. Diluted hydrochloric acid is added to the filtrate, and it is again filtered and treated with sodium carbonate, and evaporated to a soft extract.

Dose—2 to 8 grs.

Extractum Ergotæ Liquidum, 1 in 1.

A deep coffee-brown liquid, obtained by exhausting 20 ozs. of ergot with $7\frac{1}{2}$ pints of water, evaporating this to 14 ozs., and adding $7\frac{1}{2}$ ozs. alcohol (90 per cent.). Product 20 ozs.

Dose—10 to 30 mins., in water.

Infusum Ergotæ, 1 in 20 ($\frac{1}{4}$ hour).

1 oz. crushed ergot infused in 1 pint boiling distilled water.

Dose—1 to 2 ozs.

Injectio Ergotæ Hypodermica, 10 grs. in 33 mins.

(Synonym—Hypodermic Injection of Ergotin.)

100 grs. extract of ergot dissolved in a mixture of 3 grs. phenol and 220 mins. distilled water which has been boiled and cooled. It should measure 330 mins., and should be freshly prepared.

Dose—By subcutaneous injection, 3 to 10 mins.

Tinctura Ergotæ Ammoniata, 1 in 4.

A coffee-brown liquid, prepared by percolating 5 ozs. finely comminuted ergot with a mixture of 2 ozs. solution of ammonia and 18 ozs. alcohol (60 per cent.).

Dose— $\frac{1}{2}$ to 1 dr.

ETHER—(See under *Æther*).**ETHYL NITRITIS, LIQUOR** (Solution of Ethyl Nitrite).

A colourless, limpid solution in 95 per cent. absolute alcohol and 5 per cent. glycerin, of 3 per cent., by weight, of ethyl nitrite, which is obtained by interaction of alcohol (90 per cent.), sodium nitrite, and diluted sulphuric acid, at low temperature. Should be stored in small bottles.

Vaso-dilator, acting like amyl nitrite, on arterial spasm.

Dose—20 to 60 mins.

EUCALYPTI GUMMI (*Eucalyptus Gum*)—Myrtaceæ.

The ruby-coloured exudation or so-called red gum from the bark of *Eucalyptus rostrata* and other species; from Australia.

Astringent like catechu. Dose—2 to 5 grs.

Trochiscus Eucalypti Gummi, 1 gr. in each.

A lozenge, consisting of 1 gr. eucalyptus gum with fruit basis.

EUCALYPTI OLEUM (Oil of *Eucalyptus*)—Myrtaceæ.

The colourless or pale yellow oil distilled from the fresh leaves of *Eucalyptus Globulus* and other species. (Consists chiefly of a body called Cineol, Eucalyptol or Cajuputol.)

A powerful Antiseptic. Dose— $\frac{1}{2}$ to 3 mins.

Unguentum Eucalypti, 1 in 10.

A white ointment, prepared by melting white soft paraffin 5 ozs. and hard paraffin 4 ozs., and adding eucalyptus oil 1 oz. Antiseptic.

EUONYMI CORTEX (*Euonymus Bark*)—Celastraceæ.

The root-bark of *Euonymus atropurpureus* (Wahoo), in quilled or curved pieces ($\frac{1}{12}$ to $\frac{1}{8}$ inch thick), outer surface ash grey, and inner surface whitish.

Extractum Euonymi Siccum (Dry Extract of *Euonymus*).

A brownish powder, prepared by evaporating a tincture of the dried bark and adding 25 per cent. of calcium phosphate. Known as Euonymin.

Cholagogue and Cathartic. Dose—1 to 2 grs.

FEL BOVINUM PURIFICATUM (Purified Ox Bile).

A dark green soft solid, prepared by evaporating fresh ox bile to $\frac{1}{4}$ its volume, adding twice its bulk of alcohol (90 per cent.), filtering, and continuing the evaporation.

Tonic, Aperient, and Antiseptic. Dose—5 to 15 grs., in pill.

FERRUM (Iron)—Fe.

Annealed iron wire (No. 35 gauge, about 0.005 inch in diameter) or wrought nails, free from oxide. The different preparations of this substance vary in their actions. Pure iron, for example, acts simply as a Tonic and Hæmatinic or blood improver, whilst the acid preparations are generally powerful Astringents as well. Iron forms a dark ink when ordered with any of the bitter infusions, except those of Quassia and Calumba. The same remark applies to all astringent vegetable tinctures. Iron, like arsenic, should be prescribed to be taken after meals.

Liquor Ferri Acetatis (Solution of Ferric Acetate), 9.5 per cent.

A deep red fluid, prepared by dissolving ferric hydrate (formed by precipitating solution of ferric sulphate with ammonia) in glacial acetic acid and water.

Astringent, Tonic, and Diuretic. Dose—5 to 15 mins.

Ferri Arsenas (Iron Arsenate). Arseniate of Iron, B.P., 1885.

Ferrous Arsenate, $\text{Fe}_3(\text{AsO}_4)_2 \cdot 6\text{H}_2\text{O}$, with ferric arsenate and some iron oxide. A green, amorphous powder, prepared by mixing a solution of sodium arsenate with one of ferrous sulphate, adding sodium bicarbonate in solution, and drying the precipitate at a low temperature.

Resembles arsenic in its action. Dose— $\frac{1}{16}$ to $\frac{1}{4}$ gr. in pill.

Ferri Carbonas Saccharatus.

Saccharated Iron Carbonate. Ferrous oxycarbonate, $x \text{FeCO}_3, y \text{Fe}(\text{OH})_2$, more or less oxidised and mixed with sugar; the carbonate, FeCO_3 , forming about $\frac{1}{3}$ of the mixture. A greyish-brown powder, cohering in little lumps, prepared by mixing solutions of ammonium carbonate and ferrous sulphate, washing the resulting carbonate, rubbing it up with sugar, and drying.

Dose—10 to 30 grs.

Mistura Ferri Composita, $2\frac{1}{2}$ grs. sulphate to 1 oz.

A muddy, green, unstable mixture, prepared by mixing myrrh and sugar, of each 60 grs., potassium carbonate 30 grs., spirit of nutmeg 50 mins., in rose water to 7 ozs., and adding ferrous sulphate 25 grs. dissolved in rose water 3 ozs. Commonly called Griffith's Mixture; it contains about 1 gr. carbonate of iron in each ounce.

Hæmatinic and Emmenagogue. Dose— $\frac{1}{2}$ to 1 oz.

Ferri et Ammonii Citras.

Iron and Ammonium Citrate in transparent ruby scales, prepared by mixing solutions of ferric sulphate and ammonia, and dissolving the freshly-precipitated ferric hydroxide thus formed in solution of citric acid, and, after the addition of ammonia, evaporating.

Dose—5 to 10 grs. ; a most agreeable tonic, in solution.

Vinum Ferri Citratis, 8 grs. in 1 oz.

A brownish liquid, prepared by dissolving 160 grs. iron and ammonium citrate in orange wine to 1 pint.

Dose—1 to 4 drs.

Ferri et Quininæ Citras (Iron and Quinine Citrate). 1 gr. Quinine in 6.

In greenish-yellow scales, being a Citrate of Quinine, Iron and Ammonium, prepared by dissolving the ferric hydroxide (formed as in the last preparation) in citric acid, adding quinine (prepared by precipitating the sulphate by ammonia), neutralising with ammonia, and evaporating.

Hæmatinic, Tonic, Antiperiodic. Dose—5 to 10 grs.

Syrupus Ferri Iodidi, 1 gr. in 11 mins.

A colourless syrup, prepared by heating $\frac{1}{2}$ oz. iron and 726 grs. iodine with $2\frac{1}{2}$ ozs. distilled water, and adding the filtered product to 16 $\frac{1}{2}$ ozs. sugar dissolved in 6 ozs. water, and making up to 1 pint with water.

Dose— $\frac{1}{2}$ to 1 dr. Dose for a child 1 year old, 2 mins.

Liquor Ferri Perchloridi Fortis, 22.5 grs. in 110 mins.

Strong Solution of Ferric Chloride. A deep orange-brown liquid, prepared by boiling iron wire in hydrochloric acid and distilled water, and, after filtering, adding nitric acid and more hydrochloric, and concentrating by evaporation.

A powerful Astringent, Caustic, and Hæmostatic.

Liquor Ferri Perchloridi (Solution of Ferric Chloride), 1 in 4.

A brown liquid, prepared by mixing 5 ozs. strong solution of ferric chloride with distilled water to make 1 pint.

Dose—5 to 15 mins., freely diluted.

Tinctura Ferri Perchloridi, 1 in 4.

A brown liquid, prepared by adding 5 ozs. strong solution of ferric chloride to 5 ozs. alcohol (90 per cent.) and distilled water to 1 pint.

Dose—5 to 15 mins., freely diluted.

Liquor Ferri Pernitratis, 3.3 grs. iron in 110 mins.

A reddish-brown liquid, prepared by dissolving 1 oz. iron wire in $4\frac{1}{2}$ ozs. nitric acid and distilled water to 30 ozs.

Dose—5 to 15 mins., freely diluted.

Ferri Phosphas, 47 per cent. hydrous ferrous phosphate ($\text{Fe}_3(\text{PO}_4)_2 \cdot 8\text{H}_2\text{O}$) with ferric phosphate and some iron oxide.

A slate-blue amorphous powder, prepared by mixing a solution of ferrous sulphate with one of sodium phosphate, and adding sodium bicarbonate, in solution, and drying the washed precipitate.

Dose—5 to 10 grs. in powder.

Syrupus Ferri Phosphatis, 1 gr. $\text{Fe}_3(\text{PO}_4)_2$ in 1 dr.

A colourless syrup, prepared by dissolving by heat iron wire in concentrated phosphoric acid and distilled water, and filtering into syrup.

Dose— $\frac{1}{2}$ to 1 dr. diluted, in anæmic dyspepsia.

Syrupus Ferri Phosphatis cum Quinina et Strychnina, 1 gr., $\frac{4}{5}$ gr., and $\frac{1}{32}$ gr. in 1 dr. (Known as Easton's Syrup.)

A clear fluorescent syrup, made by dissolving iron wire in concentrated phosphoric acid, and in this dissolving quinine sulphate and strychnine, and filtering into syrup and adding water, the whole containing 1 gr. anhydrous ferrous phosphate, $\frac{4}{5}$ gr. quinine sulphate, and $\frac{1}{32}$ gr. strychnine in 1 dr.

General and Nervine Tonic. Dose— $\frac{1}{2}$ to 1 dr.

Ferri Sulphas, $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ (Ferrous Sulphate).

Pale, greenish-blue crystals, prepared by interaction of diluted sulphuric acid and iron.

Tonic, Astringent, and Emmenagogue. Dose—1 to 5 grs.

Ferri Sulphas Exsiccatus (Exsiccated Ferrous Sulphate), $\text{FeSO}_4 \cdot \text{H}_2\text{O}$ (Dried Sulphate of Iron, B.P., 1885).

A greyish powder, prepared by heating the last preparation at 212° till it loses 40 per cent. of its weight, and powdering the residue. $2\frac{1}{2}$ grs. = 4 grs. Ferri Sulphas.

Dose— $\frac{1}{2}$ to 3 grs. in pill.

IN—Pil. Aloes et Ferri, and

Pilula Ferri (Iron Pill), 1 gr. *carbonate* in 5.

Prepared by mixing 150 grs. exsiccated ferrous sulphate, 150 grs. syrup, 10 grs. glycerin, and 20 grs. water, and adding 95 grs. exsiccated sodium carbonate, and when reaction ceases adding 50 grs. gum acacia and 15 grs. tragacanth. Known as Blood's Pill.

Tonic and Emmenagogue. Dose—5 to 15 grs.

Liquor Ferri Persulphatis, $36\frac{1}{2}$ per cent. Fe_2SO_4 (Solution of Ferric Sulphate).

A dense dark red liquid, prepared by dissolving 8 ozs. ferrous sulphate in 6 drs. sulphuric acid and 10 ozs. distilled water, and

adding 6 drs. nitric acid in 2 ozs. distilled water, and making up to 11 ozs. after converting all the sulphate into persulphate by boiling.

Styptic ; used in making 4 preparations of iron.

Vinum Ferri, 1 oz. to 1 pint.

A brown liquid, prepared by *partially immersing* 1 oz. iron wire in 1 pint sherry for a month, with frequent agitation.

Dose—1 to 4 drs. ; contains a small amount of iron, chiefly as tartrates, malates, and citrates.

Ferrum Redactum (Reduced Iron), Fe and Fe_3O_4 .

A fine black powder, containing at least 75 per cent. of metallic iron and a variable amount of oxide, prepared by passing dry hydrogen over red-hot ferric hydroxide.

Tonic and Hæmatinic ; sometimes called Quevenne's iron.

Dose—1 to 5 grs. in pill.

Trochiscus Ferri Redacti, 1 gr. in each.

A greyish-black lozenge, consisting of reduced iron 1 gr., mixed with simple basis.

Ferrum Tartaratum (Tartarated Iron).

In deep garnet scales, prepared by dissolving freshly precipitated ferric hydroxide (deposited from ferric sulphate solution by ammonia) with acid potassium tartrate in water, filtering and evaporating to a syrup, and drying on plates.

Dose—5 to 10 grs., in solution in water.

☞ The double salts of iron with potassium, quinine, and ammonium are known as the *scale* preparations of iron from their physical characteristics.

FICUS (Fig)—Urticacæ, or Moracæ.

The dried fleshy receptacles of *Ficus Carica*, with the numerous seed-like achenes borne on its inner surface.

Laxative ; used in making *Confectio Sennæ*.

FILIX MAS (Male Fern)—Filices.

The tufted, scaly, greenish-brown rhizome, with persistent bases of the foot-stalks and root fibres of *Aspidium Filix-mas*. Collected late in the autumn, and divested of roots, leaves, and dead matter, and carefully dried. Should not be used if more than 1 year old.

Active principles—Filicic Acid and Fixed Oil.

Extractum Filicis Liquidum.

A thick, dark-green, oily liquid, being the oleo-resin prepared by extraction from the male fern rhizome by percolating it with ether, and evaporating the ethereal tincture.

Anthelmintic—for *tænia solium*. Dose—45 to 90 mins., in emulsion.

FŒNICULI FRUCTUS (Fennel Fruit)—Umbelliferæ.

The dried, pale brown, oblong, ribbed, seed-like, beaked, ripe fruit, easily separated into its two mericarps, from cultivated plants of *Fœniculum capillaceum*.

Carminative, Antispasmodic, and Galactagogue.

IN—Pulvis Glycyrrhizæ Compositus.

Aqua Fœniculi, 1 lb. to 1 gall.

A colourless water, obtained by distilling 1 gall. from 2 galls. of water, and 1 lb. fennel fruit.

Dose—1 to 3 ozs. For a child 1 year old, 1 dr.

GALBANUM (Galbanum)—Umbelliferæ.

A fetid, greenish-yellow gum resin, in small tears agglutinated into masses, derived from *Ferula galbaniflua*, and probably other species:

Antispasmodic and Expectorant. Dose—5 to 15 grs.

Pilula Galbani Composita, 1 in 3½.

(Synonym—Compound Pill of Asafetida.)

Composed of asafetida, galbanum, and myrrh, of each 2 ozs., and syrup of glucose 1 oz., heated together.

Antispasmodic in hysteria. Dose—4 to 8 grs.

GALLA (Galls)—From Cupuliferæ.

A partially insect and partially vegetable production, growing as round, tuberculated excrescences on the young shoots of oak, *Quercus infectoria*, and resulting from the irritation produced by the puncture and deposition of an egg or eggs of *Cynips Gallæ tinctoriæ*.

Active ingredients—Gallo-tannic Acid and Gallic Acid.

Astringent. Generally given in the form of tannin.

Unguentum Gallæ, 1 in 5.

A pale brown ointment, prepared by rubbing 1 oz. powdered galls with 4 ozs. benzoated lard.

Astringent. Chiefly used for hæmorrhoids.

Unguentum Gallæ cum Opio, 7½ per cent. opium.

A brown ointment, prepared by mixing 75 grs. powdered opium with 925 grs. ointment of galls.

A Local Anodyne and Astringent to painful hæmorrhoids.

Gallic and Tannic Acids. (See under Acidum.)**GELATINUM** (Gelatin).

In translucent, almost colourless sheets or shreds, being the air-dried product of the action of boiling water on such animal tissues as skin, tendons, ligaments, and bones.

Used for making suppositoria glycerini.

GELSEMI RADIX (Gelsemium Root)—Loganiaceæ.

The dried, yellowish-brown cylindrical rhizome marked with longitudinal purple lines and the attached roots of *Gelsemium nitidum*. In nearly cylindrical pieces of about 6 inches or more in length, and about $\frac{1}{2}$ inch in thickness.

Active principles—Gelseminine and Gelsemine.

Anodyne in Neuralgia of 5th nerve.

Tinctura Gelsemii, 1 in 10.

A yellowish liquid, prepared by percolating 2 ozs. gelsemium root in No. 40 powder, with alcohol (60 per cent.) to make 1 pint.

Dose—5 to 15 mins.

GENTIANÆ RADIX (Gentian Root)—Gentianaceæ.

The tough, wrinkled, or ringed brownish-yellow, dried rhizome and roots of *Gentiana lutea*, in cylindrical pieces or longitudinal slices.

Active principles—Gentiopicrin (a glucoside) and Gentisin.

Bitter Tonic, without astringency.

☞ This root is often confounded with *Belladonna* and *Pyrethrum*. From the former it is distinguished by its brownish-yellow colour, and by the close, transverse markings, which give it a ringed appearance. It differs from *pyrethrum* in its toughness, and in the absence of the black, shining points seen in the thick, brittle bark. *Gentian* is bitter, while *pyrethrum* causes a prickling sensation in the mouth.

Extractum Gentianæ.

A brownish-black, soft extract, prepared by infusing and afterwards boiling the root in water, and evaporating.

Dose—2 to 8 grs. A harmless excipient for pill masses.

Infusum Gentianæ Compositum, 1 in 80 ($\frac{1}{4}$ hour).

$\frac{1}{4}$ oz. each gentian root and dried bitter-orange peel, and $\frac{1}{2}$ oz. fresh lemon peel, infused in 1 pint boiling water.

Dose— $\frac{1}{2}$ to 1 oz.

Tinctura Gentianæ Composita, 1 in 10.

A golden-brown liquid, prepared by macerating in 1 pint alcohol (45 per cent.), 2 ozs. gentian root, $\frac{3}{4}$ oz. dried bitter-orange peel, and $\frac{1}{4}$ oz. cardamom seeds.

Dose— $\frac{1}{2}$ to 1 dr.

GLUCOSI SYRUPUS (Syrup of Glucose), 1 in 3.

Made by mixing and heating 1 oz. liquid glucose of commerce and 2 ozs. syrup. (Glucose is dextrose or grape sugar.)

Used as an excipient in 9 pill masses.

GLUSIDUM (Gluside), C_6H_4CO,SO_2,NH .

(Synonym—Glucosimide.)

Benzoyl sulphonimide ; an intensely sweet, white crystalline powder, being an imide derived from toluene. Commonly called Saccharin.

Only used as a substitute for sugar.

☞ Soluble Saccharin is prepared by evaporating a neutral solution of gluside in bicarbonate of soda.

GLYCERINUM (Glycerin), $C_3H_5(HO)_3$.

☞ Glycerin or glycerol is a colourless, oily-looking, thick, sweet fluid, obtained from fats and fixed oils by interaction with alkalis or superheated steam. It is a trihydric alcohol containing a small percentage of water.

Demulcent, Antiseptic, and Emollient. Dose—1 to 2 drs.

Suppositoria Glycerini, 70 per cent.

Translucent cones, prepared by soaking gelatin $\frac{1}{2}$ oz. in a little water till it becomes soft, and then dissolving it in glycerin $2\frac{1}{2}$ ozs. and evaporating till the mixture weighs 1,563 grs., when it is poured into moulds capable of holding 30, 60, or 120 grs., or other capacity. Each suppository contains 70 per cent. of glycerin.

Used for inserting into the rectum in constipation.

In addition to entering into the 9 Glycerins, it enters into Lin. Pot. Iod. cum Sapone, Mel Boracis, Pil. Ferri, Pil. Quin. Sulph., Confect. Sulphuris, Ext. Cinch. Liq., Ext. Sarzæ Liq., Liq. Thyroidei, Liq. Ethyl Nitritis, Lotio Hyd. Nig., Syr. Pruni Virg., Tinct. Chlor. et Morph. Co., Tr. Kino, Tr. Rhei Co., Ung. Ac. Carbolici, Ung. Iodi, and Ung. Sulph. Iod.

Glycerinum Acidi Carbolici, etc. (See under Acidum Carbolicum, etc. ; or the table upon p. 153.)

GLYCYRRHIZÆ RADIX (Liquorice Root)—Leguminosæ.

The pale yellow, tough, fibrous peeled root and underground stem, in long cylindrical pieces, of Glycyrrhiza glabra, and other species.

Active principle—Glycyrrhizin.

Demulcent ; but chiefly used for its sweetening qualities.

A mild Cathartic.

☞ This root is distinguished from others by its *yellow* and *fibrous* interior, and by its very sweet taste.

Extractum Glycyrrhizæ.

A firm, black extract, prepared by maceration of the root in cold distilled water, boiling, straining, and evaporating.

Chiefly used as an Excipient.

IN—Confect. Sennæ and Dec. Aloes Co.

Extractum Glycyrrhizæ Liquidum.

A dark liquid, prepared by boiling a cold infusion of the root, straining, and evaporating till the specific gravity of 1.20 is reached, and then adding $\frac{1}{4}$ its volume of alcohol (90 per cent.).

Dose— $\frac{1}{2}$ to 1 dr.

IN—Mist. Sennæ Co. and Tr. Aloes.

Pulvis Glycyrrhizæ Compositus, 1 in 6.

A greenish powder, consisting of senna and liquorice, of each 2 ozs., fennel and sulphur, of each 1 oz., sugar 6 ozs.

A mild Cathartic. Dose—60 to 120 grs.

In addition to the above, liquorice root enters into Liq. Sarsæ Co. Conc., and Pil. Hydrarg.

GOSSYPIUM (Cotton)—Malvaceæ. (Synonym—Cotton Wool.)

White, soft filaments or hairs of the seed of *Gossypium barbadense*, and other species of gossypium; freed from fatty matter.

Used in making Pyroxylin.

GRANATI CORTEX (Pomegranate Bark)—Myrtaceæ.

The greyish-yellow irregular curved or channelled fragments of the dried bark of the stem and root of *Punica Granatum*, marked on their outer surface with small irregular conchoidal depressions.

Active Principles—Punicine or Pelletierine and Isopelletierine and Punico-tannic Acid.

Anthelmintic; used to destroy the tapeworm.

Decoctum Granati Corticis, 1 in 5.

Prepared by taking 4 ozs. of the bark of pomegranate and 24 ozs. of water, and boiling down to 1 pint.

Dose— $\frac{1}{2}$ to 2 ozs. every 4 hours. Astringent in small doses. Cathartic in large doses.

GUAIACI LIGNUM (Guaiacum Wood)—Zygophyllaceæ.

The dense dark greenish-brown heart-wood of *Guaiacum officinale* or of *G. sanctum*. (Known as *Lignum Vitæ*.)

Diaphoretic and Alterative.

IN—Liq. Sarsæ Co. Conc.

GUAIACI RESINA (Guaiacum Resin).

The resin from the stem of *Guaiacum officinale*, or of *G. sanctum*, in large greenish-brown masses or oval tears. (It yields guaiacol on destructive distillation, and consists of Guaiaconic, Guaiacic, and Guaiacinic Acids.)

Diaphoretic and Antisymphilitic. Dose—5 to 15 grs.

Mistura Guaiaci, 11 grs. in 1 oz.

An emulsion, prepared by rubbing $\frac{1}{2}$ oz. each guaiacum resin and sugar, and 35 grs. tragacanth, with 1 pint cinnamon water.

Dose— $\frac{1}{2}$ to 1 oz.

Tinctura Guaiaci Ammoniata, 1 in 5.

A dark brown liquid, prepared by macerating 4 ozs. of guaiacum resin in 16 ozs. alcohol (90 per cent.) and $1\frac{1}{2}$ ozs. strong solution of ammonia, for 48 hours, filtering, and dissolving in the filtrate 30 mins. oil of nutmeg, and 20 mins. oil of lemon, and making up to 1 pint with alcohol (90 per cent.).

Stimulant and Diaphoretic. Dose— $\frac{1}{2}$ to 1 dr.

Trochiscus Guaiaci Resinæ, 3 grs. in each.

Lozenges composed of fruit basis with 3 grs. resin in each.

In addition to the above, the resin enters into Pil. Hyd. Subchlor. Co.

HÆMATOXYLI LIGNUM (Logwood)—Leguminosæ.

The dark red logs or iridescent chips or raspings of the heart-wood of Hæmatoxylon campechianum.

Colouring principle—Hæmatoxylin.

Astringent principle—Kino-tannic Acid.

A pure Astringent, like tannic acid.

Decoctum Hæmatoxyli, 1 in 20.

Prepared by boiling 1 oz. logwood in 24 ozs. distilled water for 10 minutes, adding 70 grs. cinnamon near the end of the process, and making the strained product to measure 1 pint.

Dose— $\frac{1}{2}$ to 2 ozs.

HAMAMELIDIS CORTEX (Hamamelis Bark)—Hamamelidaceæ. (Synonym—Witch Hazel Bark.)

The dried bark of Hamamelis virginiana in quills or curved pieces 2 to 8 inches long; externally scaly, whitish, or silvery grey; internally cinnamon-brown and striated.

Tinctura Hamamelidis, 1 in 10.

Prepared by percolating 2 ozs. witch hazel bark with 1 pint alcohol (45 per cent.).

Astringent. Dose— $\frac{1}{2}$ to 1 dr.

HAMAMELIDIS FOLIA. (Synonym—Witch Hazel Leaves.)

The fresh and dried leaves of Hamamelis virginiana or witch hazel. Oval, 3 to 6 inches long, with an oblique, heart-shaped base.

Active principles—A Volatile Oil and Tannin.

Extractum Hamamelidis Liquidum, 1 in 1.

A dark-coloured liquid, prepared by a mixed process of maceration and percolation by exhausting the powdered

leaves with alcohol (45 per cent.), reserving a portion of the resulting tincture, evaporating the remainder to the consistence of a soft extract, and dissolving it in the reserved portion.

Astringent. Dose—5 to 15 mins.

Liquor Hamamelidis, 1 in 1.

A colourless solution of hamamelis, prepared by macerating and distilling 55 ozs. from fresh hamamelis leaves 50 ozs., water 100 ozs., and alcohol (90 per cent.) 10 ozs.

Unguentum Hamamelidis, 1 in 10.

Prepared by mixing $\frac{1}{4}$ oz. liquid extract of hamamelis with $2\frac{1}{4}$ ozs. hydraous wool fat.

An Astringent application for inflamed piles.

HEMIDESMI RADIX (Hemidesmus Root)—Asclepiadaceæ.

The brownish, cylindrical, tortuous dried root of *Hemidesmus indicus*, marked with annular cracks; sometimes called Indian Sarsaparilla. Supposed to possess the properties of Sarsaparilla. It contains Coumarin—an odorous substance.

Syrupus Hemidesmi, 1 in 8 (by measure).

A yellowish-brown syrup, prepared by dissolving 28 ozs. sugar in an infusion of 4 ozs. hemidesmus root in 1 pint boiling water.

Dose— $\frac{1}{2}$ to 1 dr. Used as a pleasant addition to cough mixtures.

HIRUDO (Leeches)—Class, Annelida.

Two leeches are official—the green leech (*Sanguisuga officinalis*) and the speckled leech (*S. medicinalis*), the former having an olive-green and the latter a greenish-yellow spotted belly. *Both* species have six rusty-red longitudinal stripes on the back, which distinguish them from the horse-leech and others.

HOMATROPINÆ HYDROBROMIDUM (Homatropine Hydrobromide), $C_{16}H_{21}NO_3.HBr$.

Hydrobromate of Homatropine, B.P. Add., 1890.

The hydrobromide of an alkaloid, prepared from tropine, in minute colourless crystals.

Mydriatic and Anhidrotic. Dose— $\frac{1}{80}$ to $\frac{1}{20}$ gr.

Lamellæ Homatropinæ (Discs of Homatropine), $\frac{1}{100}$ gr. in each.

Discs of gelatin, with some glycerin, each weighing about $\frac{1}{50}$ gr., and containing $\frac{1}{100}$ gr. of homatropine hydrobromide.

HYDRARGYRUM (Mercury), Hg.

A lustrous silver-white fluid metal $13\frac{1}{2}$ times heavier than water, obtained from native mercuric sulphide.

Hydrargyrum cum Creta, 1 in 3.

(Synonym—Grey Powder.)

A greyish-blue powder exhibiting minute spherical particles, prepared by rubbing 1 oz. mercury with 2 ozs. prepared chalk.

Alterative. Dose—1 to 5 grs. For a child 1 year old, 1 gr.

Emplastrum Hydrargyri, 1 in 3.

A bluish solid, prepared by rubbing 3 ozs. mercury with a heated mixture of 56 grs. olive oil and 8 grs. sulphur, and adding 6 ozs. melted lead plaster (the sulphur aiding the division of the mercury).

Resolvent. Sometimes affects the system through skin absorption.

Emplastrum Ammoniaci cum Hydrargyro, 1 in 5 of Hg.

A dirty blue-coloured solid, composed of 3 ozs. mercury, 12 ozs. ammoniacum, 56 grs. olive oil, and 8 grs. sulphur.

Resolvent and Local Stimulant.

Linimentum Hydrargyri, 1 in 3 of Ungt., 1 in 6 of Hg.

A thick lead-coloured liquid, composed of ointment of mercury 1 oz., strong solution of ammonia 160 mins., and camphor liniment to 3 ozs.

A Stimulant to chronic joint enlargements.

Pilula Hydrargyri, 1 in 3. (Synonym—Blue Pill.)

Prepared by rubbing 2 ozs. mercury with 3 ozs. confection of roses, and adding 1 oz. liquorice in fine powder.

Dose—4 to 8 grs.

Unguentum Hydrargyri, 1 in 2.

Prepared by rubbing together 1 lb. of mercury, 1 lb. of lard, and 1 oz. suet. Called sometimes Blue ointment from its colour.

Used to introduce mercury into the system through the skin.

☞ There are 10 ointments bearing the name of mercury (Page 172).

Unguentum Hydrargyri Compositum, 1 of Hg. in 5.

A bluish ointment, consisting of ointment of mercury 10 ozs., yellow beeswax and olive oil, of each 6 ozs., camphor 3 ozs.

This is a substitute for Scott's ointment, by which name it is also known.

Hydrargyri Iodidum Rubrum (Mercuric Iodide), HgI_2 .

(Synonym—Biniodide of Mercury.)

A crystalline, vermilion powder, precipitated on mixing solutions of mercuric chloride and potassium iodide.

Antisymphilitic, Irritant, and Vesicant. Dose— $\frac{1}{32}$ to $\frac{1}{16}$ gr. in pill.

Unguentum Hydrargyri Iodidi Rubri, 1 in 25.

(Synonym—Ointment of Red Iodide of Mercury.)

A brilliant red ointment, prepared by mixing 20 grs. mercuric iodide with 480 grs. benzoated lard.

Absorbent and Rubefacient.

Liq. Arsenii et Hydrargyri Iodidi.

Donovan's Solution. (See Acid. Arsenios., p. 176.)

Liquor Hydrargyri Nitratis Acidus (Acid Solution of Mercuric Nitrate), 48 per cent.A colourless solution of 4 ozs. mercury in 5 ozs. nitric acid and $1\frac{1}{2}$ ozs. distilled water.

Caustic; not used internally.

Unguentum Hydrargyri Nitratis (Mercuric Nitrate Ointment), 1 in 16 nearly.

(Synonym—Ointment of Nitrate of Mercury.) Prepared by adding a solution of 1 oz. mercury in 3 ozs. nitric acid to a hot mixture of 4 ozs. lard and 7 ozs. olive oil. Known also as Citrine Ointment from its pale lemon colour.

A local Alterative, Astringent, and Stimulant.

Unguentum Hydrargyri Nitratis Dilutum, 1 in 5.

(Synonym—Diluted Ointment of Nitrate of Mercury.)

1 oz. mercuric nitrate ointment and 4 ozs. soft paraffin (yellow).

Hydrargyri Oleas (Mercuric Oleate).

A light greyish-yellow unctuous substance, prepared by the interaction of mercuric chloride with sodium oleate made by mixing hard soap and oleic acid.

Action same as that of Ointment of Mercury.

Unguentum Hydrargyri Oleatis, 1 in 4.

Prepared by mixing mercuric oleate 1 oz. with benzoated lard 3 ozs.

Hydrargyri Oxidum Flavum (Yellow Mercuric Oxide), HgO .

A yellow powder, prepared by mixing solutions of mercuric chloride and sodium hydroxide.

It has the same composition as Hyd. Ox. Rub., only it exists in a state of more minute division. It is the active ingredient in Yellow Wash, as the black mercurous oxide is in Black Wash.

Absorbent; not taken internally.

Unguentum Hydrargyri Oxidi Flavi, 1 in 50.

A yellow ointment, prepared by mixing 10 grs. yellow mercuric oxide, in very fine powder, with 490 grs. yellow soft paraffin.

Used in ophthalmia; known as Pagenstecher's Ointment.

Hydrargyri Oxidum Rubrum (Red Mercuric Oxide), HgO .

Called also Red Precipitate. An orange-red powder, prepared by heating mercurous nitrate until acid vapours cease to be evolved.

Unguentum Hydrargyri Oxidi Rubri, 1 in 10.

(Synonym—Red Precipitate Ointment.)

A red ointment, composed of red mercuric oxide $\frac{1}{4}$ oz., paraffin ointment (yellow) $2\frac{1}{4}$ ozs.

A local Stimulating Absorbent.

Hydrargyri Perchloridum (Mercuric Chloride), HgCl_2 .

(Synonyms—Corrosive Sublimate ; Bichloride of Mercury ; Perchloride of Mercury.)

In heavy colourless masses of prismatic crystals, prepared by subliming a mixture of mercuric sulphate, sodium chloride, and a little black oxide of manganese.

Alterative, Antisyphilitic, and powerfully Antiseptic. In even small quantity an irritant poison.

Dose— $\frac{1}{32}$ to $\frac{1}{16}$ gr. in plain solution.

Liquor Hydrargyri Perchloridi, $\frac{1}{2}$ gr. in 1 oz.

A colourless solution of 10 grs. mercuric chloride in 1 pint distilled water.

Dose— $\frac{1}{2}$ to 1 dr., diluted. Each dr. contains $\frac{1}{16}$ gr.

Lotio Hydrargyri Flava (Yellow Mercurial Lotion), 2 grs. in 1 oz.

(Synonym—Yellow Wash.)

Prepared by adding 20 grs. mercuric chloride to 10 ozs. solution of lime (the yellow oxide— HgO —falls as a precipitate).

Resembles the yellow and red oxides in action.

Hydrargyri Subchloridum (Mercurous Chloride), Hg_2Cl_2 .

(Synonyms—Hydrargyri Chloridum ; Calomel ; Subchloride of Mercury.)

A dull white heavy powder, prepared by subliming mercurous sulphate and sodium chloride.

Alterative, Purgative, and Diuretic.

Dose— $\frac{1}{2}$ to 5 grs. For a child 1 year old, 1 gr.

Lotio Hydrargyri Nigra (Black Mercurial Lotion), 3 grs. in 1 oz.

(Synonym—Black Wash.)

Prepared by triturating 30 grs. mercurous chloride with $\frac{1}{2}$ oz. glycerin and $1\frac{1}{4}$ ozs. mucilage of tragacanth, and adding in portions solution of lime to make 10 ozs., the black precipitate which falls being Hg_2O .

A Stimulating Alterative to syphilitic sores.

Pilula Hydrargyri Subchloridi Composita, 1 in 4½.

(Synonyms—Compound Calomel Pill ; Plummer's Pill.)

An orange mass, prepared by beating together 1 oz. each mercurous chloride and sulphurated antimony, 2 ozs. guaiacum resin, 180 grs. castor oil, and 1 dr. alcohol (90 per cent.).

Dose—5 to 10 grs., as an Alterative and feeble Cathartic.

Unguentum Hydrargyri Subchloridi, 1 in 10.

(Synonym—Calomel Ointment.)

A white ointment, prepared by mixing ¼ oz. mercurous chloride (calomel) and 2¼ ozs. benzoated lard.

Alterative and Resolvent, but seldom used.

Hydrargyrum Ammoniatum, NH_2HgCl .

(Synonyms—Ammonio-chloride of Mercury ; White Precipitate ; Mercuric-ammonium Chloride.) A white powder, prepared by mixing solutions of mercuric chloride and of ammonia, and washing and drying the precipitate.

Used as an Insecticide, and never taken internally.

Unguentum Hydrargyri Ammoniatum, 1 in 10.

(Synonym—White Precipitate Ointment.) 1 oz. ammoniated mercury, mixed with 9 ozs. white paraffin ointment.

A Stimulant in chronic skin diseases, and to destroy pediculi.

HYDRASTIS RHIZOMA (Hydrastis Rhizome)—Ranunculaceæ.

The dried, twisted, and knotted yellowish-brown rhizome and roots of *Hydrastis canadensis*.

Active principles—Hydrastine, Berberine, and Canadine. Tonic and Alterative to mucous membranes.

Extractum Hydrastis Liquidum, 1 in 1.

A dark brownish solution, prepared by a mixed process of percolation and maceration by exhausting the rhizome with alcohol (45 per cent.), reserving a portion of the resulting tincture and evaporating the remainder to the consistence of a soft extract, and then dissolving this in the reserved portion.

Dose—5 to 15 mins.

Tinctura Hydrastis, 1 in 10.

A yellowish liquid prepared by percolating 2 ozs. hydrastis rhizome with alcohol (60 per cent.) to make 1 pint.

Dose—½ to 1 dr.

HYDROGENII PEROXIDI LIQUOR, 10 vols., H_2O_2 .

A colourless aqueous solution of hydrogen peroxide, prepared by interaction of water, barium peroxide, and a dilute mineral

acid at a temperature below 50° F. Should yield 10 times its volume of oxygen.

Dose— $\frac{1}{2}$ to 2 drs. Antiseptic and Alterative.

HYOSCYAMI FOLIA (Hyoscyamus Leaves)—Solanaceæ.

(Synonym—Henbane Leaves.) The sinuated, hairy, *dried* leaves and flowering tops of *Hyoscyamus niger*, also the *fresh* leaves and flowers, with their branches—gathered from *biennial* flowering plants.

Active principles—Hyoscine and Hyoscyamine.

Narcotic, Anodyne, and Sedative.

Extractum Hyoscyami Viride.

A dark, soft mass, prepared by the evaporation of the juice of the fresh leaves, flowering tops and young branches of henbane, by a process identical with that used for making the Green Extract of Belladonna.

Dose—2 to 8 grs.

Pil. Colocynthis et Hyoscyami (see Colocynth).

Succus Hyoscyami.

The juice of the fresh leaves, flowering tops and young branches of biennial plants, to which $\frac{1}{3}$ of its volume of alcohol (90 per cent.) is added.

Dose— $\frac{1}{2}$ to 1 dr.

Tinctura Hyoscyami, 1 in 10.

A greenish-brown liquid, prepared by percolating 2 ozs. hyoscyamus leaves and flowering tops with alcohol (45 per cent.) to make 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

HYOSCINÆ HYDROBROMIDUM (Hyoscine Hydrobromide),
 $C_{17}H_{21}NO_4 \cdot HBr \cdot 3H_2O$.

(Synonyms—Scopolamine Hydrobromide ; Hydrobromate of Hyoscine.)

The hydrobromide of an alkaloid contained in hyoscyamus leaves, different species of *Scopola*, and other solanaceous plants. In colourless crystals, permanent in the air and very soluble in water.

General Sedative and Hypnotic. Dose— $\frac{1}{200}$ to $\frac{1}{100}$ gr.

HYOSCYAMINÆ SULPHAS (Hyoscyamine Sulphate),
 $(C_{17}H_{23}NO_3)_2 \cdot H_2SO_4 \cdot 2H_2O$.

A deliquescent crystalline powder, being the sulphate of an alkaloid contained in hyoscyamus leaves, and possibly other solanaceous plants.

General Sedative and weak Hypnotic ; useful in sea-sickness.
Dose— $\frac{1}{200}$ to $\frac{1}{100}$ gr.

IODOFORMUM (Iodoform or Tri-iodomethane), CHI_3 .

Shining lemon-yellow crystalline scales, with a penetrating disagreeable odour, produced by the action of iodine on ethylic alcohol and solution of potassium carbonate.

Antiseptic and Alterative. Dose— $\frac{1}{2}$ to 3 grs. in pill.

Suppositoria Iodoformi, 3 grs. in each.

Iodoform 36 grs., oil of theobroma 144 grs., divided into 12 suppositories.

Unguentum Iodoformi, 1 in 10.

A bright yellow ointment, consisting of iodoform $\frac{1}{4}$ oz. mixed with paraffin ointment (yellow) $2\frac{1}{4}$ ozs.

Disinfectant, Antiseptic, and Antisyphilitic.

IODUM (Iodine), I.

A non-metallic element, in dark, lustrous, laminar crystals, obtained from the ashes of seaweeds, and from native iodides and iodates.

Lymphatic Stimulant, Absorbent, Alterative, and Caustic.

Starch and free ammonia are incompatible with iodine preparations.

Liquor Iodi Fortis (Strong Solution of Iodine), 1 in 9.

Liniment of Iodine, B.P., 1885. A dark, reddish-brown liquid, prepared by dissolving iodine $1\frac{1}{4}$ ozs., potassium iodide $\frac{3}{4}$ oz., in water $1\frac{1}{4}$ ozs., and adding alcohol (90 per cent.) 9 ozs. About $4\frac{1}{2}$ times the strength of the tincture.

Absorbent and Counter-irritant.

Tinctura Iodi, 1 in 40.

A deep red liquid, prepared by dissolving iodine $\frac{1}{2}$ oz., potassium iodide $\frac{1}{2}$ oz., in water $\frac{1}{2}$ oz., and adding alcohol (90 per cent.) to make 1 pint.

Dose—2 to 5 mins., diluted.

Unguentum Iodi, 1 in 25.

A brown ointment, prepared by rubbing iodine 20 grs., potassium iodide 20 grs., with glycerin 60 grs., and lard 400 grs. Resolvent, Alterative, and Irritant.

(Iodides of Sodium, Arsenic, Iron, Mercury, Potassium, Sulphur, and Lead, and their preparations, are given under the name of each metal.)

IPECACUANHÆ RADIX (Ipecacuanha Root)—Cinchonaceæ.

The dried root of Psychotria Ipecacuanha, in small, annular, contorted, brown, worm-like pieces. Known also as Hippo.

Dose— $\frac{1}{4}$ to 2 grs. as an Expectorant, and 15 to 30 grs. as an Emetic. For a child 1 year old, as an Expectorant, $\frac{1}{12}$ to $\frac{1}{4}$ gr. ; as an Emetic, 2 to 4 grs.

Active principles—Emetine, Cephaeline, and Psychotrine.

Acetum Ipecacuanhæ.

A solution prepared by mixing 1 oz. liquid extract of ipecacuanha, 2 ozs. alcohol (90 per cent.), and diluted acetic acid q.s. to 1 pint.

Dose—10 to 30 mins.

Extractum Ipecacuanhæ Liquidum, 2 to $2\frac{1}{4}$ per cent. alkaloids.

A dark brown liquid, obtained by macerating and percolating ipecacuanha root with alcohol (90 per cent.), mixing the marc with calcium hydroxide, and exhausting by further percolation. The first portion of percolate is reserved, and the alcohol recovered from the remainder. The resulting extract is dissolved in the reserved portion, and its alkaloidal strength having been tested, it is made to contain 2 to $2\frac{1}{4}$ grs. alkaloids in 110 mins.

Dose— $\frac{1}{2}$ to 2 mins. as an Expectorant, 15 to 20 mins. as an Emetic.

Pilula Ipecacuanhæ cum Scilla, 1 in 20. 5 per cent. opium.

Composed of compound powder of ipecacuanha 3 ozs., squill and ammoniacum, of each 1 oz., syrup of glucose q.s., beaten into a mass.

Expectorant, Diaphoretic, Diuretic. Dose—4 to 8 grs.

Pulvis Ipecacuanhæ Compositus, 1 in 10. 10 per cent. opium.

(Synonym—Dover's Powder.) A fawn-coloured powder, composed of opium $\frac{1}{2}$ oz., ipecacuanha $\frac{1}{2}$ oz., sulphate of potassium 4 ozs.

Diaphoretic and Anodyne. Dose—5 to 15 grs.

Trochiscus Ipecacuanhæ, $\frac{1}{4}$ gr. in each.

Each composed of ipecacuanha root $\frac{1}{4}$ gr. with fruit basis.

Expectorant.

Trochiscus Morphinæ et Ipecacuanhæ, $\frac{1}{36}$ and $\frac{1}{12}$ gr.

Each consists of morphine hydrochloride $\frac{1}{36}$ gr., ipecacuanha root $\frac{1}{12}$ gr., mixed with tolu basis.

Action similar to Dover's Powder.

Vinum Ipecacuanhæ, 1 oz. liq. ext. in 1 pint.

A brownish liquid, prepared by mixing 1 oz. liquid extract of ipecacuanha and 19 ozs. sherry.

Dose—10 to 30 mins. as an Expectorant ; 4 to 6 drs. as an Emetic. Emetic dose for a child 1 year old, 1 dr.

JABORANDI FOLIA (Jaborandi Leaves)—Rutaceæ.

The dried, greyish-green, shortly-stalked, coriaceous, oblong leaflets of *Pilocarpus Jaborandi*, from $2\frac{1}{2}$ to 4 inches in length.

Sialagogue, Diuretic, Diaphoretic, and Expectorant.

Pilocarpine is the active principle. They also contain Iso-pilocarpine ; Jaborine is a mixture of both alkaloids.

Extractum Jaborandi Liquidum, 1 in 1.

A dark-coloured liquid extract, prepared by exhausting jaborandi leaves 20 ozs. by percolation with alcohol (45 per cent.), reserving the first 17 ozs. of percolate, and evaporating the remainder to a soft extract, which is dissolved in the reserved portion, and making the whole up to 20 ozs. with alcohol (45 per cent.).

Dose—5 to 15 mins.

Tinctura Jaborandi, 1 in 5.

A brown liquid prepared by percolating 4 ozs. jaborandi leaves in No. 40 powder with alcohol (45 per cent.) to 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

JALAPA (Jalap)—Convolvulaceæ.

The dried tuberous root, in brown, wrinkled, dense, ovoid tubercles, from a pigeon's to a turkey's egg in size, of *Ipomœa* Purga.

Active principle—Convolvulin, which chiefly constitutes the resin, along with some Jalapin.

Drastic Purgative.

Dose—5 to 20 grs. 1 to 2 grs. for a child 1 year old.

Extractum Jalapæ.

A dark brown firm extract, obtained by evaporating a strong tincture of jalap root, and also by evaporating a cold infusion made from the marc of the tincture, mixing the two extracts thus obtained, and continuing the evaporation.

Dose—2 to 8 grs., in pill.

Pulvis Jalapæ Compositus, 1 in 3.

A powder closely resembling Dover's in appearance, composed of jalap 5 ozs., acid potassium tartrate 9 ozs., and ginger 1 oz.

Hydragogue Cathartic. Dose—20 to 60 grs.

Tinctura Jalapæ, 1½ per cent. resin.

A deep brown liquid, prepared by percolating 4 ozs. jalap, in No. 40 powder, with alcohol (70 per cent.), and made to contain 1·5 per cent. resin.

Dose— $\frac{1}{2}$ to 1 dr.

In addition to the above, Jalap enters into Pulv. Scammonii Co.

Jalapæ Resina.

A dark brown shining solid, in opaque brittle fragments, prepared by exhausting jalap with spirit, evaporating and precipitating the resin from the resulting concentrated tincture by adding water, washing, and drying on a water-bath.

More powerful than jalap. Dose—2 to 5 grs.

Enters into Pilula Scammonii Co.

JUNIPERI OLEUM (Oil of Juniper)—From Coniferæ.

The colourless or pale yellow oil distilled from the full-grown unripe green fruit of *Juniperus communis*.

A Stimulating Diuretic. Dose— $\frac{1}{2}$ to 3 mins.

Spiritus Juniperi, 1 in 20.

Oil of juniper 1 oz. and alcohol (90 per cent.) to 1 pint.

If not clear, shake with powdered talc, and filter.

Dose—20 to 60 mins.

IN—Mistura Creosoti.

KAOLINUM (Kaolin).

A clay in the form of a soft white powder, obtained by elutriation of native aluminium silicate.

Emollient in eczema. It is used as a variety of Fuller's Earth.

IN—Pil. Phosphori.

KINO (Kino)—From Leguminosæ.

The evaporated juice, in small angular, glistening, dark red pieces, from incisions in the trunk of *Pterocarpus Marsupium*.

Astringent (contains about 80 per cent. of tannin).

Dose, in powder—5 to 20 grs.; should not be ordered with iron.

Active ingredients—Kino-tannic Acid and Pyrocatechin.

In addition to the following, Kino enters into Pulv. Catechu Co

Pulvis Kino Compositus, 3 in 4. 5 per cent. opium.

A dark brownish-red powder composed of kino $3\frac{3}{4}$ ozs., opium $\frac{1}{4}$ oz., cinnamon 1 oz.

Astringent, Anodyne, and Narcotic. Dose—5 to 20 grs.

Tinctura Kino, 1 in 10.

A reddish-brown liquid, prepared by dissolving kino, powdered, 2 ozs., in glycerin 3 ozs., distilled water 5 ozs., alcohol (90 per cent.) to 1 pint. (It is liable to gelatinise, owing to the presence of an enzyme in the kino.)

Dose— $\frac{1}{2}$ to 1 dr.

KRAMERIÆ RADIX (Krameria Root)—Polygalaceæ.

(Synonym—Rhatany Root.)

The dried root of *Krameria argentea* (Para rhatany) or *K. triandra* (Peruvian rhatany), in long cylindrical pieces, purplish-brown or reddish-brown in colour.

Astringent and Tonic. (Contains much Kino-tannic Acid.)

In addition to the following, Krameria enters into Pulv. Catechu Co.

Extractum Krameriae.

(Synonym—Extract of Rhatany.)

A deep reddish-brown, *solid* extract, obtained by exhausting krameria root with water, and evaporating the liquid to dryness.

Dose—5 to 15 grs., in pill, or rubbed up with chalk mixture.

Infusum Krameriae, 1 in 20 ($\frac{1}{4}$ hour).

(Synonym—Infusion of Rhatany.)

Krameria root 1 oz. infused in boiling water 20 ozs.

Dose— $\frac{1}{2}$ to 1 oz.

Liquor Krameriae Concentratus, 1 in 2.

A blackish-brown liquid obtained by percolating 10 ozs. krameria root with 25 ozs. alcohol (20 per cent.) to produce 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

Tinctura Krameriae, 1 in 5.

(Synonym—Tincture of Rhatany.)

A deep red liquid, prepared by percolating krameria root in No. 40 powder 4 ozs., with alcohol (60 per cent.) q.s. to make 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

Trochiscus Krameriae, 1 gr. in each.

(Synonym—Rhatany Lozenge.)

Prepared with extract of krameria and fruit basis.

Trochiscus Krameriae et Cocainæ, 1 gr. and $\frac{1}{20}$ gr. in each.

(Synonym—Rhatany and Cocaine Lozenge.)

Prepared with extract of krameria, cocaine hydrochloride, and fruit basis.

LAUROCERASI FOLIA (Cherry-Laurel Leaves)—Rosaceæ.

The elliptical, smooth, shining, thick, deep-green, *fresh* leaves of *Prunus Laurocerasus*—the common or cherry-laurel.

Aqua Laurocerasi, 1 lb. to 1 pint (.1 per cent. HCN.).

A colourless liquid, prepared by distilling 1 pint from 1 lb. fresh cherry-laurel leaves and 2 $\frac{1}{2}$ pints water, and making its strength correspond to .1 per cent. real hydrocyanic acid.

Sedative. Dose— $\frac{1}{2}$ to 2 drs.

LAVANDULÆ OLEUM (Oil of Lavender)—Labiatae.

The almost colourless fragrant oil distilled from the flowers of *Lavandula vera*.

Carminative and Antispasmodic. Dose— $\frac{1}{2}$ to 3 mins.

IN—Linim. Camph. Ammon.

Spiritus Lavandulæ, 1 in 10.

Oil of lavender 1 oz. and alcohol (90 per cent.) to 10 ozs.

Dose—5 to 20 mins.

Tinctura Lavandulæ Composita, 45 mins. to 1 pint.

A bright crimson liquid, prepared by macerating cinnamon and nutmeg, of each 75 grs., and red sanders wood 150 grs., in alcohol (90 per cent.) 1 pint, filtering, and adding oil of lavender 45 mins., and oil of rosemary 5 mins.

Dose— $\frac{1}{2}$ to 1 dr.

Used to colour Liquor Arsenicalis.

LIMONIS CORTEX (Lemon Peel)—Aurantiaceæ.

The *fresh* outer part of the pericarp of the fruit of *Citrus medica* var. *B. Limonum*.

Aromatic ; chiefly used for its flavour..

It enters into Inf. Aurant. Co. and Inf. Gent. Co. and the following :—

Oleum Limonis.

The pale yellow, fragrant *volatile* oil, from fresh lemon peel, generally obtained by expression.

Dose— $\frac{1}{2}$ to 3 mins., but chiefly used for flavouring.

IN—Lin. Pot. Iod. cum Sapone, Spt. Ammon. Aromat., Tinct. Guaiaci Ammon., and Tinct. Valer. Ammon.

Succus Limonis, 30 to 40 grs. citric acid in 1 oz.

The freshly expressed juice of the ripe fruit of *Citrus medica* var. *B. Limonum*. A slightly turbid yellowish liquid.

Refrigerant and Antiscorbutic. Dose— $\frac{1}{2}$ to 2 ozs.

110 mins. of lemon juice are neutralised by about 11 $\frac{1}{2}$ grs. KHCO_3 , or about 9 $\frac{1}{2}$ grs. NaHCO_3 , or about 16 $\frac{1}{2}$ grs. Na_2CO_3 .

Syrupus Limonis, 1 of juice in 2.

A yellowish syrup, prepared by dissolving 38 ozs. sugar in 25 ozs. lemon juice which has been clarified by subsidence, and when cold adding 2 ozs. of a tincture of lemon peel, which has been made by macerating 1 oz. fresh lemon peel in 1 $\frac{1}{2}$ ozs. alcohol (90 per cent.) for 7 days, and, after pressing and filtering, making up to 2 ozs. with the alcohol.

Dose— $\frac{1}{2}$ to 1 dr.

Tinctura Limonis, 1 in 4.

A sherry-coloured liquid, prepared by macerating fresh lemon peel 5 ozs. in 1 pint alcohol (90 per cent.).

Dose— $\frac{1}{2}$ to 1 dr.

LINUM (Linseed)—Linaceæ.

The small, shining, oval, brown, pointed seeds of *Linum usitatissimum*—common flax.

Demulcent and Emollient (owing to the presence of mucilaginous substances resembling Arabin).

Linum Contusum (Crushed Linseed).

Linseed reduced to coarse powder; it should be recently prepared, and should contain not less than 30 per cent. of oil.

Used for making poultices.

Oleum Lini (Linseed Oil).

The viscid yellow oil expressed without heat from linseed.

Only used externally as an Emollient.

LITHII CARBONAS (Lithium Carbonate), Li_2CO_3 .

In a white powder, or in minute crystalline grains, obtained from native silicates of lithium.

Diuretic and Antacid. Dose—2 to 5 grs.

Lithii Citras (Lithium Citrate), $\text{C}_3\text{H}_4\text{OH}(\text{COOLi})_34\text{H}_2\text{O}$.

A white crystalline deliquescent salt, prepared by saturating citric acid with lithium carbonate. Acts like the carbonate.

Dose—5 to 10 grs. in solution, freely diluted.

Lithii Citras Effervescens (Effervescent Lithium Citrate), 1 in 20.

A white granular powder, prepared by mixing lithium citrate 5 ozs., citric acid 21 ozs., tartaric acid 31 ozs., and sodium bicarbonate 58 ozs., all in powder, heating to between 200° and 220° F., and stirring to cause granulation; product should weigh 100 ozs.

Dose—60 to 120 grs.

LOBELIA (Lobelia)—Lobeliaceæ.

The dried flowering herb of *Lobelia inflata* (Indian Tobacco) in compressed rectangular parcels of angular stems, alternate toothed hairy leaves and inflated fruits.

Nauseating Expectorant, Antispasmodic and Emetic.

Active principle, extracted with difficulty—Lobeline, a non-volatile alkaloid, with some volatile and fixed oil.

Tinctura Lobeliæ Ætherea, 1 in 5.

A green liquid, prepared by percolating lobelia 4 ozs., in coarse powder, with spirit of ether to produce 1 pint.

Dose—5 to 15 mins.

LUPULUS (Hops)—Cannabinaceæ.

(Synonym—*Humulus*.)

The dried, greenish-yellow strobiles of *Humulus Lupulus*, from cultivated plants.

A Bitter Tonic and feeble Narcotic.

Lupulinum (Lupulin).

A granular, brownish-yellow glandular powder, obtained from the dried strobiles of *Humulus Lupulus*. (Contains a volatile oil, bitter principle, known as Lupulite, and resins.)

Tonic, Anodyne, and Hypnotic. Dose—2 to 5 grs.

Infusum Lupuli, 1 in 20 ($\frac{1}{4}$ hour).

Prepared by infusing hops 1 oz. in boiling water 1 pint.

Dose—1 to 2 ozs.

Tinctura Lupuli, 1 in 5.

A red liquid, prepared by macerating hops 4 ozs. with alcohol (60 per cent.) 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

MAGNESIA PONDEROSA (Heavy Magnesia), MgO .

(Synonyms—Heavy Calcined Magnesia ; Heavy Magnesium Oxide.)

A white insoluble powder, prepared by exposing heavy magnesium carbonate to a dull red heat.

Antacid, Laxative, and Antilithic.

Dose—5 to 30 grs. for repeated administration ; single dose—30 to 60 grs. May be used in *Pulvis Rhei Co*.

Magnesia Levis (Light Magnesia), MgO .

(Synonyms—Light Calcined Magnesia ; Light Magnesium Oxide.)

A bulky, white, insoluble powder, identical with the preceding, only lighter, bulk for bulk, in the ratio of $3\frac{1}{2}$ to 1. Prepared by calcining light magnesium carbonate.

Dose—5 to 30 grs. for repeated administration ; single dose—30 to 60 grs. In—*Pulvis Rhei Compositus*.

Magnesii Carbonas Ponderosus ($MgCO_3$)₃, $Mg(HO)_24H_2O$,
(Heavy Magnesium Carbonate.)

A white granular, insoluble powder, prepared by mixing *strong* hot solutions of magnesium sulphate and sodium carbonate, washing and drying the precipitate by a heat not exceeding 212° .

Antacid and Purgative.

Dose—5 to 30 grs. for repeated administration ; single dose—30 to 60 grs.

IN—*Liq. Magnes. Carb. and Troch. Bismuthi*.

Magnesii Carbonas Levis ($MgCO_3$)₃, $Mg(HO)_24H_2O$,
(Light Magnesium Carbonate.)

A very light, partially amorphous, insoluble powder, prepared by mixing *weak* cold solutions of magnesium sulphate

and sodium carbonate, boiling, washing the precipitate, and drying by a heat not exceeding 212° .

Dose—5 to 30 grs. for repeated administration ; single dose—30 to 60 grs.

Liquor Magnesii Carbonatis, 10 grs. in 1 oz.

(Synonym—Fluid Magnesia.)

A colourless liquid, prepared by mixing together a solution of magnesium sulphate 2 ozs. in water 10 ozs., heated to boiling point, and a solution of sodium carbonate $2\frac{1}{2}$ ozs. in water 10 ozs., boiling, washing carefully the precipitated magnesium carbonate, mixing it with distilled water 1 pint, and passing pure carbonic acid gas, at three atmospheres pressure, through till it is dissolved.

Antacid. Dose—1 to 2 ozs. ; $\frac{1}{2}$ dr. for a child 1 year old.

Magnesii Sulphas, $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$.

(Synonym—Epsom Salt.)

In minute, colourless, rhombic prisms, prepared by the interaction of native magnesium carbonates and diluted sulphuric acid ; or by purifying the native sulphate. 3 ozs. dissolve in 4 ozs. water.

Hydragogue Purgative.

Dose—30 to 120 grs. for repeated administration ; $\frac{1}{4}$ to $\frac{1}{2}$ oz. for single dose.

In addition to the following, it enters into Mist. Sennæ Co., 1 in $5\frac{1}{2}$.

Magnesii Sulphas Effervescens, 1 in 2.

(Synonym—Effervescent Epsom Salt.)

Prepared by drying 50 ozs. magnesium sulphate, and mixing it with 36 ozs. sodium bicarbonate, 19 ozs. tartaric acid, $12\frac{1}{2}$ ozs. citric acid, and $10\frac{1}{2}$ ozs. sugar, all in powder, heating between 200° and 220° F., and stirring assiduously till the powder becomes granulated. The product should weigh 100 ozs.

Cathartic and Antacid. Dose—60 to 240 grs. for repeated administration ; $\frac{1}{2}$ to 1 oz. for single dose.

MEL DEPURATUM (Clarified Honey).

Honey strained, whilst hot, through wetted flannel, and existing as a yellowish translucent liquid or as an opaque crystalline semisolid.

Enters into Confection of Pepper, and :—

Mel Boracis (Borax Honey), 1 in $9\frac{1}{2}$.

Of the consistence of honey, and prepared by rubbing borax 1 oz. with clarified honey 8 ozs., and glycerin $\frac{1}{2}$ oz.

Alterative to diseased mucous surfaces.

Oxymel (Oxymel), 4 in 5.

A thick syrupy liquid, composed of clarified honey (liquefied) 40 ozs., acetic acid 5 ozs., water about 5 ozs. S.G. 1.32.

Expectorant, but chiefly used as a vehicle. Dose—1 to 2 drs.

Oxymel Scillæ (Oxymel of Squill).

Prepared by macerating $2\frac{1}{2}$ ozs. squill in $2\frac{1}{2}$ ozs. acetic acid and 8 ozs. water; mixing the filtrate (10 oz.) with 27 fl. ozs. liquefied clarified honey, or q.s. to produce S.G. 1.32.

Expectorant. Dose— $\frac{1}{2}$ to 1 dr.

MENTHÆ PIPERITÆ OLEUM (Oil of Peppermint).

The colourless or pale yellow oil distilled from the fresh flowering herb of *Mentha piperita*. (Labiata.)

Antispasmodic and Carminative. Dose— $\frac{1}{2}$ to 3 mins.

It enters into Pil. Rhei Co., Tr. Chlorof. et Morph. Co., and

Aqua Menthæ Piperitæ, 1 in 1,000.

A colourless liquid, prepared by mixing oil of peppermint 77 mins. with water $1\frac{1}{2}$ galls., and distilling 1 gall.

Dose—1 to 2 ozs.; 1 dr. for a child 1 year old.

Spiritus Menthæ Piperitæ, 1 in 10.

Oil of peppermint 1 oz. and alcohol (90 per cent.) to 10 ozs.

Dose—5 to 20 mins.

☞ This is half the strength of the B.P. Essence, '85.

MENTHÆ VIRIDIS OLEUM (Oil of Spearmint).

The colourless or pale yellow oil distilled from the fresh flowering herb of *Mentha viridis*. (Labiata.)

Action and dose similar to peppermint.

Aqua Menthæ Viridis, 1 in 1,000.

A colourless liquid, obtained by mixing oil of spearmint 77 mins. and water $1\frac{1}{2}$ galls., and distilling 1 gall.

Dose—1 to 2 ozs.; 1 dr. for a child 1 year old.

MENTHOL (Menthol), C_6H_9OH, CH_3, C_3H_7 .

A stearoptene in colourless crystals, or in fused crystalline masses, obtained by cooling the oil distilled from the fresh herb of *Mentha arvensis*, vars. *piperascens* et *glabrata*, and of *M. piperita*.

Antiseptic, Carminative, and Local Anæsthetic.

Dose— $\frac{1}{2}$ to 2 grs. in pill; or rubbed on the skin as a local Anæsthetic. Sometimes called Peppermint Camphor.

Emplastrum Menthol, 1 in 6 $\frac{2}{3}$.

A yellowish solid, prepared by melting together 1 oz. yellow beeswax and $7\frac{1}{2}$ ozs. resin, and stirring in $1\frac{1}{2}$ ozs. menthol.

Local Anodyne.

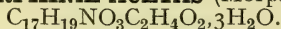
MEZEREI CORTEX (Mezereon Bark)—Thymelaceæ.

The dried bark, in tough brown strips or quilled pieces of various lengths, of *Daphne Mezereum*, of *D. Laureola*, or of *D. Gnidium*. (Active principles—Daphnin, a Volatile Oil, and Resin.)

Vesicant and Alterative.

Seldom used internally.

Enters into Liq. Sarsæ Co. Conc. 1 in 20.

MORPHINÆ ACETAS (Morphine Acetate).

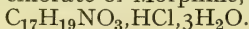
A white soluble powder, prepared by neutralising morphine with acetic acid.

Anodyne and Narcotic. Dose— $\frac{1}{8}$ to $\frac{1}{2}$ gr.

Liquor Morphinæ Acetatis, 1 gr. in 110 mins. (1 per cent.).

An almost colourless liquid, prepared by dissolving morphine acetate 17 $\frac{1}{2}$ grs. in distilled water and alcohol (90 per cent.), of each 1 oz., and diluted acetic acid 38 mins., and making up to 4 ozs. with water.

Dose—10 to 60 mins.

Morphinæ Hydrochloridum (Morphine Hydrochloride)—Hydrochlorate of Morphine, B.P., 1885.

The hydrochloride of an alkaloid, in white, fine, silky prisms, obtained from opium.

Action, dose, and strength similar to morphine acetate.

Liquor Morphinæ Hydrochloridi, 1 gr. in 110 mins. (1 per cent.).

A colourless liquid, prepared by dissolving morphine hydrochloride 17 $\frac{1}{2}$ grs. in distilled water and alcohol (90 per cent.), of each 1 oz. and diluted hydrochloric acid 38 mins., and adding water q.s. to make 4 ozs.

Dose—10 to 60 mins.

Suppositoria Morphinæ, $\frac{1}{4}$ gr. in each.

Composed of morphine hydrochloride 3 grs., and oil of theobroma 177 grs., in 12 conical suppositories.

Trochiscus Morphinæ, $\frac{1}{36}$ gr. in each.

White lozenges, composed of morphine hydrochloride $\frac{1}{36}$ gr. with tolu basis.

Trochiscus Morphinæ et Ipecacuanhæ, $\frac{1}{36}$ and $\frac{1}{12}$ gr.

White lozenges, each composed of morphine hydrochloride $\frac{1}{36}$ gr. and ipecacuanha root $\frac{1}{12}$ gr., with tolu basis.

Tinctura Chloroformi et Morphinæ Composita (see p. 213).

Morphinæ Tartras (Morphine Tartrate),
($C_{17}H_{19}NO_3$)₂, $C_4H_6O_6$, 3 H_2O .

A white crystalline powder, obtained by combining morphine and tartaric acid in molecular proportions.

Dose— $\frac{1}{8}$ to $\frac{1}{2}$ gr. Acts like the hydrochloride and acetate.

Injectio Morphinæ Hypodermica, 5 grs. in 110 mins.

A straw-coloured liquid, prepared by dissolving morphine tartrate 50 grs. in water which has been boiled and cooled, to produce 1,100 mins.

Dose, by subcutaneous injection—2 to 5 mins.

Liquor Morphinæ Tartratis, 1 gr. in 110 mins.

A colourless liquid, prepared by dissolving morphine tartrate 17 $\frac{1}{2}$ grs. in distilled water and alcohol (90 per cent.), of each 1 oz., and making up to 4 ozs. with distilled water.

Action and dose same as hydrochloride and acetate solutions.

MORRHUÆ OLEUM (Cod-Liver Oil).

The pale yellow oil extracted from the fresh liver of the cod—*Gadus Morrhua*—by a heat not exceeding 180°, and from which solid fat has been separated by filtration at about 23° F.

A Nutritive Tonic. Dose—1 to 4 drs., in emulsion, or in milk.

MOSCHUS (Musk).

The dried secretion from the preputial follicles of *Moschus moschiferus* (the musk deer of Thibet), in small, irregular, reddish-black grains.

Stimulant and Antispasmodic. Dose—5 to 10 grs.

MYRISTICA (Nutmeg)—*Myristicaceæ*.

The oval, furrowed, dried seed of *Myristica fragrans* divested of its testa; the transverse section has a marbled appearance. Carminative and Narcotic.

In addition to the following, Nutmeg enters into Pulv. Catechu Co., Pulv. Cretæ Arom., Spt. *Armoraciæ* Co., and Tinct. Lavand. Co.

Oleum Myristicæ (Oil of Nutmeg).

The pale yellow oil distilled from nutmeg. (It contains Limonene, Pinene, and Myristicol.)

Dose— $\frac{1}{2}$ to 3 mins., on sugar.

Enters into Pil. Aloes Socot., Spt. Ammon. Aromat., Tinct. Guaiaci Ammon., and Tr. Valer. Ammon.

Spiritus Myristicæ, 1 in 10.

Oil of nutmeg 1 oz. and alcohol (90 per cent.) to 10 ozs. If not clear, shake with talc, and filter.

Dose—5 to 20 mins.

Enters into Mist. Ferri Comp.

MYRRHA (Myrrh)—Amyridaceæ.

A gum-resinous exudation, in irregular brownish-yellow or red tears or masses, from the stem of *Balsamodendron Myrrha*, and probably other species. (Contains a Volatile Oil, Myrrhol, Myrrhin, Resins, and a Gum.)

Emmenagogue and Expectorant. It increases phagocytosis.

Enters into Dec. Aloes Co., Mist. Ferri Co., Pil. Aloes et Myrrhæ, Pil. Galbani Co., and Pil. Rhei Co.

Tinctura Myrrhæ, 1 in 5.

A pale brown liquid, prepared by macerating myrrh 4 ozs. with alcohol (90 per cent.) to 1 pint.

Dose— $\frac{1}{2}$ to 1 dr., in sherry, or in emulsion.

NAPHTHOL (Beta-naphthol), $C_{10}H_7OH$.

Beta-naphthol or beta-mono-hydroxy-naphthalene occurs in powder or crystalline laminæ, with a phenol-like odour, and is usually prepared from naphthalene-sulphonic acid.

Intestinal Antiseptic and Stimulating Application in scaly skin affections.

Dose—3 to 10 grs.

NUX VOMICA (Nux Vomica)—Loganiaceæ.

The dried, ripe, circular, horny, button-shaped seeds, about 1 inch in diameter, covered with short, satiny hairs, of *Strychnos Nux-vomica*.

Tonic, and Stimulant to the Spinal Cord.

Active principles—Strychnine and Brucine.

Dose—1 to 4 grs., in powder.

Extractum Nucis Vomicae Liquidum, 1½ per cent. Strychnine.

A brown liquid, obtained by percolating powdered nux vomica with alcohol (70 per cent.). The first portion of percolate is reserved, and in this the soft extract obtained by evaporating the remainder is dissolved. The percentage of strychnine in the solution is estimated, and enough alcohol (70 per cent.) is added to make the resulting liquid extract contain 1½ gr. of the alkaloid—Strychnine—in 110 mins.

Dose—1 to 3 mins.

Extractum Nucis Vomicae, 5 per cent. Strychnine.

A brown extract, prepared by evaporating 10 ozs. of the liquid extract to 3 ozs., an estimated amount of milk sugar being finally added so as to make the firm extract contain 5 per cent. of the alkaloid.

Dose— $\frac{1}{4}$ to 1 gr.

Tinctura Nucis Vomicae, .25 per cent. Strychnine.

A sherry-coloured liquid, prepared by mixing 2 ozs. liquid extract of *nux vomica*, 3 ozs. water, and alcohol (90 per cent.) q.s. to make 12 ozs. It contains about $\frac{1}{8}$ gr. Strychnine in 1 dr.

Dose—5 to 15 mins.

OLIVÆ OLEUM (Olive Oil)—Oleaceæ.

The yellow oil expressed from the ripe fruit of *Olea Europæa*.

Dose—2 drs. to 1 oz. as a laxative.

IN—4 plasters, 4 ointments, and 3 liniments.

OPIUM (Opium)—Papaveraceæ.

The milky juice inspissated by spontaneous evaporation obtained by incision, from the unripe capsules of the poppy—*Papaver somniferum*—in irregular lumps of from $\frac{1}{2}$ to 2 lbs. ; when fresh, tearing with an irregular, moist brown surface, and possessing a strong characteristic odour and bitter taste. 100 grs. of the dry powder should yield about 10 grs. anhydrous morphine ; but weaker opium is officially permitted as a source of alkaloids, and of the tincture and extract of opium which are standardised.

Active principles—Morphine, Codeine, Narcotine, Thebaine and Papaverine. Contains 13 other alkaloids. Anodyne and Narcotic. Dose— $\frac{1}{2}$ to 2 grs.

Pulvis Opii, Opium in powder (of a rich brown colour).

Although not under a separate heading in the B.P., it is inserted here to remind the student that opium cannot be powdered until it is first dried, and that in drying it loses water, and in grinding there is a further loss of inert woody fibrous impurities, so that the powder is stronger than the fresh opium by about one-eighth, 7 grains being equal to 8 of opium.

Emplastrum Opii, 1 in 10.

A hard brown solid, prepared by heating resin plaster 9 ozs., and adding, by degrees, powdered opium 1 oz.

Extractum Opii, 1 from 2 (20 per cent. Morphine).

A dark brown, tough extract, prepared by evaporating a cold infusion of 1 lb. opium, till the product weighs $\frac{1}{2}$ lb.

Dose— $\frac{1}{4}$ to 1 gr. It is much stronger than powdered opium, and is said to be less stimulating.

Extractum Opii Liquidum, .75 per cent. morphine.

A dark brown liquid, consisting of extract of opium $\frac{3}{4}$ oz., dissolved in distilled water 16 ozs., and alcohol (90 per cent.) 4 ozs.

Dose—5 to 30 mins.

Though considerably weaker, this is regarded as the representative of Battley's Sedative Liquor.

Linimentum Opii, 1 in 2.

An almost black liquid, consisting of equal parts laudanum and soap liniment.

Pilula Ipecacuanhæ cum Scilla, 1 in 20, or 5 per cent. opium.

A brown mass, composed of Dover's powder 3 ozs., squill 1 oz., ammoniacum 1 oz., syrup of glucose q.s., beaten together.

Narcotic and Expectorant. Dose—4 to 8 grs.

Pilula Plumbi cum Opio, 1 in 8, or 12½ per cent. opium.

A brownish-black mass, composed of acetate of lead 36 grs., opium in powder 6 grs., and syrup of glucose 4 grs.

Astringent as well as Narcotic. (Should be made fresh.)

Dose—2 to 4 grs.

Pilula Saponis Composita, 1 in 5, or 20 per cent. opium.

A light brown mass, composed of opium in powder ½ oz., hard soap 1½ ozs., syrup of glucose ½ oz. beaten together.

Dose—2 to 4 grs. The name Pil. Saponis Co. is used to disguise its composition.

Pulvis Cretæ Aromaticus cum Opio, 1 in 40, or 2½ per cent. opium.

A pale brown powder, composed of opium ¼ oz., aromatic chalk powder 9¾ ozs.

Carminative and Anodyne; well adapted for children.

Dose—10 to 40 grs.; for a child 1 year old, ½ to 1 gr.

Pulvis Ipecacuanhæ Compositus, 1 in 10. 10 per cent. opium (Synonym—Dover's Powder.)

A fawn-coloured powder, composed of ipecacuanha and opium of each ½ oz., sulphate of potassium 4 ozs.

Diaphoretic and Anodyne. Dose—5 to 15 grs.

IN—Pilula Ipecacuanhæ cum Scilla.

Pulvis Kino Compositus, 1 in 20. 5 per cent. opium.

A dark red powder, composed of kino 3¾ ozs., opium ¼ oz., cinnamon 1 oz.

Astringent and Narcotic. Dose—5 to 20 grs.

Pulvis Opii Compositus, 1 in 10. 10 per cent.

A brown powder, composed of opium 1½ ozs., black pepper 2 ozs., ginger 5 ozs., caraway 6 ozs., tragacanth ½ oz.

Carminative and Narcotic. Dose—2 to 10 grs.

Suppositoria Plumbi Composita, 1 gr. of opium in each.

Composed of acetate of lead 3 grs., opium 1 gr., oil of theobroma 11 grs. in each.

Tinctura Camphoræ Composita, $\frac{1}{4}$ gr. opium in 1 dr.

(Synonyms—Paregoric ; Paregoric Elixir.)

A sherry-coloured liquid, composed of tincture of opium 585 mins., benzoic acid 40 grs., camphor 30 grs., oil of anise 30 mins., alcohol (60 per cent.) q.s. to make 1 pint.

Anodyne, Expectorant, and Stimulant.

Dose— $\frac{1}{2}$ to 1 dr. ; for a child 1 year old, 4 mins. This is the only safe liquid preparation of opium for infants.

Tinctura Opii, 75 per cent. morphine, or 1 gr. opium in 15 mins.

(Synonym—Laudanum.)

A dark reddish-brown liquid, prepared by infusing 3 ozs. opium in 10 ozs. water at 200° F. for 6 hours, adding 10 ozs. alcohol (90 per cent.), macerating for 24 hours, straining, and filtering after 24 hours. The percentage of morphine is calculated, and alcohol (90 per cent.) and water in equal parts are added to make the tincture contain 75 per cent. of the alkaloid.

Narcotic and Anodyne. Dose—5 to 15 mins. for repeated administration ; 20 to 30 mins. for a single dose.

IN—Linimentum Opii, Tinct. Camph. Co., and

Tinctura Opii Ammoniata, about $\frac{3}{8}$ gr. opium in 1 dr.

A dark brown liquid, prepared by mixing tincture of opium 3 ozs., benzoic acid 180 grs., oil of anise 1 dr., solution of ammonia 4 ozs., and alcohol (90 per cent.) to 1 pint. Commonly known as Scotch Paregoric.

Anodyne and Expectorant. Dose— $\frac{1}{2}$ to 1 dr., freely diluted.**Unguentum Gallæ cum Opio**, $7\frac{1}{2}$ per cent. opium.

A brown ointment, prepared by rubbing up powdered opium 75 grs. with ointment of galls 925 grs.

A soothing Anodyne to painful hæmorrhoids.

The following preparations contain Opium, but under another name :—

Pilula Ipecacuanhæ cum Scilla.

Pilula Plumbi cum Opio.

Pilula Saponis Co.

Pulvis Cretæ Aromat. cum Opio.

Pulvis Ipecacuanhæ Co.

Pulvis Kino Co.

Suppositoria Plumbi Composita.

Tinct. Camphoræ Co.

Ungt. Gallæ cum Opio.

OXYMEL and OXYMEL SCILLÆ (see under Mel and Scilla).**PANCREATIS LIQUOR** (Pancreatic Solution).

A colourless liquid, containing the digestive principles of the fresh pancreas of the pig ; obtained by digesting in 20 ozs. of alcohol (20 per cent.) for 7 days 5 ozs. pancreas which has been freed from fat, and finely divided by aid of fine sand or pow-

dered pumice-stone. The preparation is most active when the animal has been fed shortly before being killed.

Used as a peptonising agent.

PAPAVERIS CAPSULÆ (Poppy Capsules)—Papaveraceæ.

The large, globular, crowned, dried, nearly ripe fruits of the white poppy, *Papaver somniferum*, with their numerous white reniform seeds.

Anodyne and Narcotic, resembling opium.

PARAFFINUM DURUM (Hard Paraffin).

A colourless, translucent, waxy-looking substance, melting between 130° and 135° F., being a mixture of several of the harder members of the paraffin series of hydrocarbons; obtained by distillation from shale, and purified after separation of the liquid oils by refrigeration.

Used as a basis for ointments, into 3 of which it enters.

PARAFFINUM LIQUIDUM (Liquid Paraffin).

A clear, colourless, odourless, non-fluorescent, oily liquid obtained from petroleum, after the more volatile portions have been removed by distillation.

Alterative and Sedative to inflamed mucous membranes.

PARAFFINUM MOLLE (Soft Paraffin).

A translucent, semisolid, unctuous substance, being a mixture of the soft members of the paraffin series of hydrocarbons; usually obtained by purifying the less volatile portions of petroleum. It is commonly known as Vaseline, and exists in the *white* and *yellow* varieties.

Emollient and Protective. Enters into 6 ointments.

Unguentum Paraffini (Paraffin Ointment).

A yellow or white ointment, obtained by melting together hard paraffin 3 ozs. and soft paraffin (white or yellow) 7 ozs.

Used as a basis for 11 ointments.

PARALDEHYDUM (Paraldehyde), $C_6H_{12}O_3$.

A colourless liquid, with a disagreeable ethereal odour and burning taste, being the product of the polymerisation of aldehyde by various acids and salts. Soluble in about 10 times its volume of water.

Hypnotic. Dose— $\frac{1}{2}$ to 2 drs.

PAREIRÆ RADIX (Pareira Root)—Menispermaceæ.

The dried root of *Chondrodendron tomentosum*, in long, nearly cylindrical pieces, more or less twisted, from $\frac{3}{4}$ to 3 inches

thick, showing on cross section medullary rays and concentric rings.

Active principle—Pelosine, which is identical with berberine and buxine.

Diuretic, and Anodyne to the mucous lining of the bladder.

Extractum Pareiræ Liquidum, 25 per cent. of extractives.

A black liquid, prepared by exhausting, by maceration and percolation, pareira root with *boiling* water, evaporating till it contains $\frac{1}{3}$ of its weight of extractive matter, and adding alcohol (90 per cent.) so as to produce from 3 volumes of the evaporated liquid 4 volumes of liquid extract.

Dose— $\frac{1}{2}$ to 2 drs.

PEPSINUM (Pepsin).

A yellowish-white amorphous powder, or in thin translucent grains or scales, being the enzyme obtained from the mucous membrane of the fresh and healthy stomach of the pig, sheep, or calf. Should dissolve 2,500 times its weight of hard-boiled white of egg.

Digestive. Dose—5 to 10 grs.

Glycerinum Pepsini (Glycerin of Pepsin), 5 grs. in 1 dr.

A clear, almost colourless liquid, obtained by macerating for a week, pepsin 800 grs., in a mixture of hydrochloric acid 110 mins., glycerin 12 ozs., and water 6 ozs., filtering, and adding water to produce 1 pint.

Dose—1 to 2 drs.

PHENACETINUM (Phenacetin), $C_2H_5O, C_6H_4, NHCOCH_3$.

Para-acet-phenetidin in colourless, tasteless, inodorous, scaly crystals, produced by the action of glacial acetic acid on para-phenetidin, a body obtained from para-nitro-phenol.

Antipyretic and Analgesic. Dose—5 to 10 grs.

PHENAZONUM (Phenazone).

(Phenyl-dimethyl-iso-pyrazolone), $C_6H_5(CH_3)_2C_3HN_2O$.

Colourless, inodorous, bitter scaly crystals, very soluble in water; obtainable from phenyl-hydrazine by interaction with aceto-acetic ether, and the subsequent interaction of the resulting phenyl-methyl-iso-pyrazolone with methyl iodide. Commonly known as Antipyrine.

Antipyretic and Analgesic. Dose—5 to 20 grs.

PHOSPHORUS (Phosphorus), P.

A semitransparent, wax-like, solid, non-metallic element, emitting white vapour and luminous in the dark; obtained from calcium phosphate.

Tonic and Restorative.

Dose, in pill or solution— $\frac{1}{100}$ to $\frac{1}{20}$ gr.

Used in preparing Concentrated Phosphoric Acid.

Oleum Phosphoratum (Phosphorated Oil), 1 per cent.

A clear, straw-coloured oil, phosphorescent in the dark, prepared by heating almond oil to 300° , filtering when cold, and dissolving 1 part by weight of dry phosphorus in 99 parts by weight of the oil, at a temperature of 180° F.

Dose—1 to 5 mins.—*i.e.*, $\frac{1}{100}$ to $\frac{1}{20}$ gr. of phosphorus.

Pilula Phosphori, 1 in 50.

Prepared by dissolving 10 grs. phosphorus in 33 mins. bisulphide of carbon, and carefully mixing with a melted mixture of 125 grs. each white beeswax and lard, cooled to the consistence of cream, adding 115 grs. kaolin and mixing till thoroughly incorporated. The mass should be kept immersed in cold water in a dark place, and 1 gr. gum acacia added to every 3 grs. of mass immediately before dispensing.

Dose—1 to 2 grs.—*i.e.*, $\frac{1}{50}$ to $\frac{1}{25}$ gr. of phosphorus.

PHYSOSTIGMATIS SEMINA (Calabar Bean)—Leguminosæ.

The large kidney-shaped, brown, dried, ripe seed, with a furrow along its convex margin, of *Physostigma venenosum*.

Active principle—Physostigmine, with calabarine and eseridine.

Local Myotic. Internally—Spinal Sedative.

Extractum Physostigmatis.

A dark brown firm extract, prepared by evaporating a strong tincture of Calabar bean made with alcohol (90 per cent.) to the consistence of a very soft extract, and mixing with 3 times its weight of milk sugar.

Dose— $\frac{1}{4}$ to 1 gr., in pill.

Physostigminæ Sulphas (Physostigmine Sulphate).

$(C_{15}H_{21}N_3O_2)_2, H_2SO_4, xH_2O$.

(Synonym—Eserine Sulphate.)

The sulphate of an alkaloid, in pinkish or colourless deliquescent crystals, obtained from Calabar bean.

A Myotic or pupil contractor. Dose— $\frac{1}{60}$ to $\frac{1}{20}$ gr.

Lamellæ Physostigminæ (Discs of Physostigmine or Eserine).

Discs of gelatin, with some glycerin, each weighing about $\frac{1}{50}$ gr., and containing $\frac{1}{1000}$ gr. physostigmine sulphate.

Used to cause contraction of the pupil.

PICROTOXINUM (Picrotoxin)—Menispermaceæ.

A neutral principle in minute, colourless, inodorous, prismatic, bitter crystals, obtained from the seeds of *Anamirta paniculata*.

Anhidrotic. Dose— $\frac{1}{100}$ to $\frac{1}{25}$ gr.

PILOCARPINÆ NITRAS (Pilocarpine Nitrate).

The nitrate of an alkaloid, obtained from jaborandi leaves. In minute acicular crystals or as a white powder.

Diaphoretic, Sialagogue, Expectorant. Dose— $\frac{1}{20}$ to $\frac{1}{2}$ gr.

PIMENTA (Pimento)—Myrtaceæ.

The small, round, rough, brown, dried, full-grown, unripe berries of the allspice tree—*Pimenta officinalis*.

Stimulant and Carminative.

Aqua Pimentæ, 8 ozs. to 1 gall.

A brownish unstable preparation, obtained by mixing pimento 8 ozs. with water 2 galls., and distilling off 1 gall.

Carminative. Dose—1 to 2 ozs.

Oleum Pimentæ.

An oil (yellowish or yellowish-red when prepared, but soon becoming darker) distilled from pimento or allspice. It consists chiefly of Eugenol.

Dose— $\frac{1}{2}$ to 3 mins., in pill, or on sugar, or in an emulsion.

PINI OLEUM (Oil of Pine)—Coniferæ.

The nearly colourless oil, with aromatic odour, distilled from the fresh leaves of *Pinus Pumilio*.

Rubefacient and Astringent like turpentine.

PIPER NIGRUM (Black Pepper)—Piperaceæ.

The small, round, wrinkled, brownish-black, dried, unripe fruit of *Piper nigrum*. (It contains a volatile oil, a resin, and an alkaloid—Piperidine.)

Carminative and Diuretic.

It enters into Pulv. Opii Co., and the following :—

Confectio Piperis, 1 in 10.

An almost black firm paste, prepared by mixing powdered black pepper 2 ozs., caraway fruit 3 ozs., with clarified honey 15 ozs. Resembles and is sometimes called Ward's paste, and is in repute as an internal remedy for hæmorrhoids.

Dose—60 to 120 grs.

PIX BURGUNDICA (Burgundy Pitch)—From Coniferæ.

An opaque, brittle, yellow solid, being a resinous exudation from the stem of *Picea excelsa*, melted and strained. Seldom used except to impart solidity and rubefacient qualities to plasters.

Emplastrum Picis (Pitch Plaster), 1 in 2.

A yellow solid, composed of Burgundy pitch 26 ozs., frankincense 13 ozs., resin and yellow beeswax of each $4\frac{1}{2}$ ozs., olive

oil and water of each 2 ozs., melted, and evaporated with constant stirring.

A Rubefacient and Stimulating Plaster.

PIX CARBONIS PRÆPARATA (Prepared Coal Tar).

Obtained by placing commercial coal tar in a shallow vessel, and maintaining it at a temperature of 120° F. for one hour, stirring frequently.

Liquor Picis Carbonis (Solution of Coal Tar), 1 in 6.

A dark brown transparent liquid, made by digesting at 120° F. for 2 days 4 ozs. prepared coal tar in 1 pint of a tincture of quillaia, obtained by percolating 2 ozs. quillaia bark with alcohol (90 per cent.) to make 1 pint.

A Stimulating Application in scaly skin diseases.

PIX LIQUIDA (Tar)—From Coniferæ.

A blackish, viscid, bituminous liquid, obtained by destructive distillation from the wood of *Pinus sylvestris* and other pines. Known as Stockholm Tar. (Contains Cresol and Guaiacol.)

Expectorant. A Stimulating Application (when diluted with wax, etc.) to chronic scaly skin affections.

Unguentum Picis Liquidæ, 5 in 7.

A black ointment, prepared by melting yellow beeswax 2 ozs., and adding tar 5 ozs., and stirring whilst the mixture cools.

PLUMBI ACETAS (Lead Acetate), $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2 \cdot 3\text{H}_2\text{O}$.

In white, crystalline, slightly efflorescent masses, obtained by dissolving lead oxide or lead carbonate in acetic acid. It has an acetous odour and sweet taste, and is known as "Sugar of lead."

Sedative and Astringent. Used in internal hæmorrhages.

Dose—1 to 5 grs., in solution or in pill.

As this salt forms insoluble precipitates, it should not be ordered with iodides, sulphates, or tannates.

Glycerinum Plumbi Subacetatis (Glycerin of Lead Subacetate), 1 in 6 by weight.

A thick, colourless liquid, prepared by boiling, filtering, and evaporating to 32 $\frac{3}{4}$ ozs. by weight, 5 ozs. lead acetate, 3 $\frac{1}{2}$ ozs. lead oxide, 20 ozs. glycerin, and 12 ozs. water.

Astringent and Local Sedative.

Unguentum Glycerini Plumbi Subacetatis.

See table on p. 262.

Pilula Plumbi cum Opio, 3 of lead and $\frac{1}{2}$ of opium in 4.

A light brown mass, prepared by beating together lead acetate 36 grs., opium 6 grs., syrup of glucose 4 grs.

Sedative, Narcotic, and Astringent. Dose—2 to 4 grs.

Suppositoria Plumbi Composita, 3 grs. in each.

Prepared by mixing lead acetate 36 grs., opium 12 grs., oil of theobroma 132 grs., and dividing into 12 cones.

Anodyne and Astringent. Each contains 1 gr. of opium.

Unguentum Plumbi Acetatis. (See table on next page.)**Liquor Plumbi Subacetatis Fortis** (Strong Solution of Lead Subacetate), 24 per cent. of $\text{Pb}_2\text{O}(\text{C}_2\text{H}_3\text{O}_2)_2$.

(Synonym—Goulard's Extract.)

A colourless solution, becoming turbid on exposure to air, of lead subacetate in water, prepared by boiling lead acetate 5 ozs. with lead oxide $3\frac{1}{2}$ ozs. in distilled water q.s. to make 1 pint.

Powerfully Astringent, but only used diluted.

Liquor Plumbi Subacetatis Dilutus (Diluted Solution of Lead Subacetate), 2 drs. in 1 pint.

(Synonyms—Goulard's Lotion ; Goulard Water.)

A colourless liquid, prepared by mixing strong solution of lead subacetate and alcohol (90 per cent.), of each 2 drs., with distilled water $19\frac{1}{2}$ ozs.

An Astringent and Local Sedative.

Plumbi Carbonas, $2\text{PbCO}_3, \text{Pb}(\text{HO})_2$.

A soft, heavy, white powder, known as "White lead," prepared by interaction of lead, water, and carbonic anhydride in the presence of vapours of acetic acid.

Not used internally ; externally, mildly Astringent.

Unguentum Plumbi Carbonatis. (See table on next page.)**Plumbi Iodidum**, PbI_2 .

A bright yellow powder, prepared by interaction of lead nitrate or acetate and potassium iodide.

Resolvent and Antiparasitic.

Emplastrum Plumbi Iodidi, 1 in 10.

A bright yellow solid, composed of lead iodide 2 ozs., lead plaster 1 lb., and resin 2 ozs.

Alterative and Resolvent to chronic enlargements.

Unguentum Plumbi Iodidi. (See table on next page.)**Plumbi Oxidum**, PbO . (Synonym—Litharge.)

In heavy, yellowish-red or brick-red, coppery scales, obtained by the action of air on melted lead.

Used in making Liq. Plumbi Subacetatis Fortis, Plumbi Acetas Glycerinum Plumbi Subacetatis, and the following :—

Emplastrum Plumbi (Lead Plaster).

A pale yellow solid, consisting of oleate, palmitate, and stearate of lead, and a little glycerin ; it is, chemically speaking, a *soap*. It is prepared by boiling in a steam-bath lead oxide 1 lb., olive oil 2 lbs., and water 16 ozs., for 4 or 5 hours, till a proper consistence is obtained. Known as Diachylon or Litharge Plaster.

A supporting Sedative and Protective application.

It enters into 9 plasters either as lead or resin plaster.

☞ Of the 12 official plasters, 9 contain lead. The exceptions are—E. Ammon. c. Hydrarg., E. Picis, and E. Menthol.

The following 4 plasters are often grouped together as the "Lead Plasters"—Plumbi, Plumbi Iodidi, Resinæ, and Saponis.

The lead is in the form of oleate, palmitate, and stearate, but chiefly as oleate.

OINTMENTS OF LEAD.

UNGUENTUM.	COMPOSITION.	COLOUR AND STRENGTH.
Plumbi Acetatis .. $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2, 3\text{H}_2\text{O}.$	Acetate in fine powder 20 grs., paraffin ointment (white) 480 grs.	White, 1 in 25.
Plumbi Carbonatis .. 2PbCO_3 & $\text{Pb}(\text{HO})_2$	Carbonate in fine powder $\frac{1}{4}$ oz., paraffin ointment (white), $2\frac{1}{4}$ ozs.	Cream, 1 in 10.
Plumbi Iodidi .. $\text{PbI}_2.$	Iodide in fine powder $\frac{1}{4}$ oz., paraffin ointment (yellow) $2\frac{1}{4}$ ozs.	Yellow, 1 in 10.
Glycerini Plumbi Sub-acetatis $\text{Pb}_2\text{O}(\text{C}_2\text{H}_3\text{O}_2)_2.$	Glycerin of subacetate 1 oz., paraffin ointment (white) 5 ozs.	White, 1 in 6.

PODOPHYLLI RHIZOMA (Podophyllum Rhizome)—Ranunculaceæ.

(Synonym—Podophyllum Root.)

The brown, wrinkled and knotted, dry rhizome and roots of Podophyllum peltatum. (It is also known as Mayapple or Mandrake.)

Hydragogue Cathartic and Hepatic Stimulant. Dose—10 to 20 grs.

Its active principle is the following resin :—

Podophylli Resina (Podophyllum Resin).

A pale greenish-brown powder, prepared by pouring a concentrated alcoholic tincture of podophyllum rhizome into water, when the resin is precipitated ; it is afterwards washed and dried. (It is commonly called Podophyllin.)

Dose— $\frac{1}{4}$ to 1 gr. in pill ; generally combined with aloes, etc.

Tinctura Podophylli, 2 grs. in 1 dr.

Prepared by dissolving 320 grs. podophyllum resin in alcohol (90 per cent.) to 1 pint, making a brown liquid.

Dose—5 to 15 mins.

POTASSA CAUSTICA (Potassium Hydroxide), KHO.

(Synonyms—Caustic Potash ; Potassium Hydrate.)

Hydrate of Potassium, B.P., 1885.

In hard, white, deliquescent pencils or cakes, containing not more than 10 per cent. of combined water and impurities ; prepared by interaction of potassium carbonate with calcium hydroxide. Soluble in $\frac{1}{2}$ its weight of water.

Acts as a powerful Caustic.

Is contained in Liquor Potassæ, and is used in making the Permanganate.

Liquor Potassæ, 27 grs. Caustic Potash in 1 oz.

A colourless aqueous solution, containing in 110 mins. 6.22 grs., or in 1 oz. 27 grs., of potassium hydroxide.

Antacid. Dose—10 to 30 mins., freely diluted.

Used in making the Bromide and Iodide of Potassium.

Potassa Sulphurata (Sulphurated Potash).

(Synonym—Liver of Sulphur.)

A mixture of salts of potassium, of which the chief are potassium sulphides, in dark green or liver-coloured, hard, flat fragments, prepared by fusing together potassium carbonate and sublimed sulphur.

Antiparasitic and Narcotic. Only used externally.

Potassii Acetas, CH_3COOK .

White, foliaceous, satiny, deliquescent masses or granular particles, prepared by neutralising potassium carbonate with acetic acid, and fusing. Soluble in $\frac{1}{2}$ its weight of water.

Diuretic and mildly Cathartic.

Dose—10 to 60 grs. ; 1 to 3 grs. for a child 1 year old.

Potassii Bicarbonas, KHCO_3 .

(Synonym—Potassium Hydrogen Carbonate.)

Colourless, prismatic crystals, obtained by saturating a strong aqueous solution of potassium carbonate with carbonic anhydride. Soluble in less than four times its weight of water.

Antacid, Diuretic, and Antilithic.

Dose—5 to 30 grs., in solution. 20 grs. are neutralised by 14 grs. citric or 15 grs. tartaric acid.

Potassii Bichromas (Potassium Bichromate), $\text{K}_2\text{CrO}_4, \text{CrO}_3$.

(Synonyms—Red Chromate of Potassium ; Potassium Dichromate.)

In large, orange-red, transparent, triclinic crystals, obtained

by roasting chrome ironstone with lime in presence of air, and treating the resulting chromate with a potassium salt, and subsequently with an acid.

Used in preparing Acid. Chromic.

Dose— $\frac{1}{10}$ to $\frac{1}{5}$ gr. in Dyspepsia.

Potassii Bromidum, KBr.

Colourless, cubical crystals, obtained by adding bromine to a strong solution of potassium hydroxide, which forms a solution of bromide and bromate of potassium. This is evaporated to dryness, and the residue fused with charcoal, which converts the bromate into bromide; the product is purified by crystallisation.

Hypnotic, and Sedative to the nervous system and the larynx.

Dose—5 to 30 grs., in solution. Soluble—1 in 2 of water.

Potassii Carbonas, K_2CO_3 with either 1 or 2 molecules of water of crystallisation. (Synonym—Salt of Tartar.)

A white, crystalline, deliquescent powder, obtained from the ashes of wood or by the interaction of crude potassium sulphate and crude calcium carbonate and carbon. It is soluble in an equal weight of water.

Action similar to the Bicarbonate.

Dose—5 to 20 grs.

It is used in the preparation of Decoct. Aloes Co., Liquor Arsenicalis, Potassa Caustica, Mist. Ferri Co., Potassa Sulphurata, Potassii Acetas, Potassii Bicarbonas, Potassii Citras, and Potassii Tartras.

Potassii Chloras, $KClO_3$.

In colourless, monoclinic crystals, prepared by passing chlorine into water holding lime or magnesia in suspension, and treating the clarified liquid with potassium chloride, and crystallising. Soluble in 16 parts of water.

Diuretic, and Alterative to diseased mucous surfaces.

Dose—5 to 15 grs., in solution.

It is used in the preparation of Potassii Permanganas, and

Trochiscus Potassii Chloratis, 3 grs. in each.

A white lozenge, consisting of chlorate of potassium 3 grs., with rose basis.

Dose—1 to 6 lozenges.

Potassii Citras, $C_3H_4OH, (COOK)_3$.

A white, deliquescent powder, prepared by neutralising a solution of citric acid with potassium carbonate.

A pleasant Refrigerant, Diaphoretic, and Diuretic.

Dose—10 to 40 grs. in water (in which it is very soluble).

Potassii Iodidum, KI.

Colourless, cubical crystals, prepared like the bromide, using iodine instead of bromine.

Alterative and Resolvent in syphilis and scrofula.

Dose—5 to 20 grs., in pills or solution. Soluble in less than its own weight of water.

The following preparations contain this salt in the following quantities per 1 oz. :—

Lin. Pot. Iod. cum Sapone 49 grs.	Tinctura Iodi 10 grs. nearly.
Liquor Iodi Fortis 26 $\frac{3}{4}$ grs.	Unguent. Iodi 17 $\frac{1}{2}$ grs.
nearly.	Unguent. Potassii Iod. 43 $\frac{3}{4}$ grs

Linimentum Potassii Iodidi cum Sapone, 1 in 10 by W.

A white substance of the consistence of thick cream or soft paste, prepared by dissolving 2 ozs. curd soap in 1 oz. glycerin and 10 ozs. water on a water-bath, and triturating the solution with 1 $\frac{1}{2}$ ozs. potassium iodide and adding 1 dr. oil of lemon.

Alterative and Resolvent, and does not stain the skin.

Unguentum Potassii Iodidi, 1 in 10.

A white ointment, prepared by dissolving potassium iodide 50 grs. and potassium carbonate 3 grs. in distilled water 47 grs. and adding benzoated lard 400 grs.

Acts like the liniment.

Potassii Nitras, KNO₃. (Synonyms—Nitre ; Saltpetre.)

In long, striated, prismatic crystals, or white crystalline masses, obtained by purifying the crude native nitre, or by the interaction of sodium nitrate and potassium chloride. Soluble 1 in 4 of water.

Diuretic and Diaphoretic. Dose—5 to 20 grs. in solution.

IN—Argenti Nitras Induratus and Argenti Nitras Mitigatus.

Potassii Permanganas, K₂Mn₂O₈.

Dark purple, iridescent, slender, prismatic crystals, prepared by interaction of potassium chlorate, potassium hydroxide, and manganese dioxide.

Antiseptic, Deodorant, and Emmenagogue.

Dose—1 to 3 grs.

As it destroys all organic substances and decomposes most inorganic, should be given only in water or pill made with kaolin.

Liquor Potassii Permanganatis, 1 gr. in 110 mins. (1 per cent.).

A deep purple liquid, half the strength of Condry's fluid, prepared by dissolving potassium permanganate 87 $\frac{1}{2}$ grs. in distilled water to 20 ozs.

Dose—2 to 4 drs., in distilled water.

Potassii Sulphas, K_2SO_4 .

In colourless, very hard, rhombic prisms, terminated by six-sided pyramids. May be obtained by purifying the crude native salt, or by the interaction of sulphuric acid and potassium chloride or certain other potassium salts.

A mild Cathartic. Dose—10 to 40 grs.

IN—Pil. Colocynth. Co. and Pulv. Ipecac. Co., and their compounds.

Potassii Tartras $(CHOH)_2(COOK)_2H_2O$.

Small, colourless, prismatic crystals, prepared from cream of tartar by neutralising it with potassium carbonate.

Hydragogue Cathartic and Diuretic. Dose—30 to 240 grs.

Potassii Tartras Acidus $(CHOH)_2COOH.COOK$.

(Synonyms—Bitartrate of Potassium; Purified Cream of Tartar.)

A gritty, white powder, or fragments of cakes crystallised on one surface, obtained from the crude cream of tartar, which is deposited during the fermentation of grape juice and from the lees of wine.

A Hydragogue Cathartic and Diuretic.

Dose—20 to 60 grs. As a purgative, $\frac{1}{4}$ to $\frac{1}{2}$ oz. (1 pint of water only dissolves about 50 grs.) It is elegantly administered in the form of a conserve with twice its bulk of orange marmalade.

Used in preparing Tartaric Acid, Tartar Emetic, Confection and Lozenge of Sulphur, Compound Jalap Powder, Tartarated Iron, Potassium Tartrate, and Sodium Potassium Tartrate.

PRUNI VIRGINIANÆ CORTEX (Virginian Prune Bark)—Rosaceæ.

The bark in irregular or incurved pieces of *Prunus serotina*, collected in autumn. Outer surface rough and reddish, with a thin brown papery layer; inner surface fissured. Contains Amygdalin and Emulsin, which form hydrocyanic acid on the addition of water.

A Nerve Sedative and Tonic.

Syrupus Pruni Virginianæ, 3 in 20.

A brownish-coloured, thick liquid, prepared by macerating and percolating 3 ozs. Virginian prune bark in No. 20 powder with water, collecting 9 ozs. of percolate, and dissolving in it, without heat, 15 ozs. sugar, and adding $1\frac{1}{4}$ ozs. glycerin and water q.s. to make 1 pint.

Dose— $\frac{1}{2}$ to 1 dr. for allaying irritable coughs.

Tinctura Pruni Virginianæ, 1 in 5.

A dark red liquid, prepared by macerating 4 ozs. Virginian prune bark in No. 20 powder in $7\frac{1}{2}$ ozs. water for 24 hours,

then continuing the maceration with $12\frac{1}{2}$ ozs. alcohol (90 per cent.).

Dose— $\frac{1}{2}$ to 1 dr.

PRUNUM (Prunes)—Rosaceæ.

The oblong, black, shrivelled, dried, ripe fruit of *Prunus domestica* *var.* *Juliana*.

A mild Laxative, entering into *Confectio Sennæ*.

PTEROCARPI LIGNUM (Red Sanders Wood)—Leguminosæ.

(Synonym—Red Sandal Wood.)

Dense, heavy, dark reddish-brown billets (raspings or chips) of the heart-wood of *Pterocarpus santalinus*. The powder is blood-red.

Used only for colouring *Tinct. Lavandulæ Co.*

PYRETHRI RADIX (Pyrethrum Root)—Compositæ.

The dried root of *Anacyclus Pyrethrum*, in unbranched, wrinkled pieces about the size of the little finger, with their brown bark, the cortex being studded with black points. Easily recognised by the prickling sensation when chewed. Known as Pellitory Root.

Powerful Sialagogue, greatly increasing the flow of saliva.

Active principles—Pyrethrine, Resin, and Volatile Oil.

Tinctura Pyrethri, 1 in 5.

A dark, sherry-coloured liquid, prepared by percolating pyrethrum root 4 ozs. with alcohol (70 per cent.) to 1 pint.

Used locally to promote the flow of saliva.

PYROXYLINUM (Pyroxylin).

Resembling cotton-wool in appearance, and prepared by mixing sulphuric and nitric acids, 5 ozs. each, and immersing cotton 1 oz. in the mixture for 3 minutes, transferring it to a vessel of water, in which it is to be thoroughly washed, and drying on a water-bath. Commonly called Gun-cotton.

Enters into *Collodium*, *Collodium Flexile*, and *Collodium Vesicans*.

QUASSIÆ LIGNUM (Quassia Wood)—Simarubaceæ.

The yellowish-white shavings, chips, or raspings, or large dense billets of *Picræna excelsa*.

Bitter Tonic without astringency; and, as it contains no tannin, it can be ordered with iron preparations.

Active principle—Quassin.

Infusum Quassiae, 88 grs. to 1 pint—cold ($\frac{1}{4}$ hour).

Prepared by infusing quassia wood, finely rasped, 88 grs. in cold distilled water 1 pint.

Dose— $\frac{1}{2}$ to 1 oz.

Liquor Quassiae Concentratus, 1 in 10.

A straw-coloured liquid prepared by percolating 1 pint from quassia wood in No. 40 powder 2 ozs. with alcohol (20 per cent.) 22 ozs.

Dose— $\frac{1}{2}$ to 1 dr.

Tinctura Quassiae, 1 in 10.

A straw-coloured liquid, prepared by macerating quassia wood, rasped, 2 ozs. in alcohol (45 per cent.) 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

QUILLAIAE CORTEX (Quillaia Bark)—Rosaceæ.

(Synonym—Panama Bark.)

The inner bark, in large, brownish-white, flat pieces of Quillaia saponaria, known also as Soap Bark.

Active principles—Sapotoxin, Quillaic Acid, and Saponin.

Expectorant, and emulsifying agent.

Used in making Liquor Picis Carbonis.

Tinctura Quillaiae, 1 in 20.

A pale, straw-coloured liquid, obtained by percolating 1 oz. Quillaia bark with alcohol (60 per cent.) to produce 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

QUININÆ HYDROCHLORIDUM, $C_{20}H_{24}N_2O_2HCl, 2H_2O$.

(Hydrochlorate of Quinine, B.P., 1885.)

The hydrochloride of an alkaloid, obtained from the bark of various species of cinchona and remijia, in crystals slightly larger than those of sulphate of quinine. *Soluble in 35 parts of water.*

Tonic, Antiperiodic, and Antipyretic. Dose—1 to 10 grs.

Tinctura Quininæ, 1 in 50.

A bright golden liquid, consisting of hydrochloride of Quinine 175 grs. dissolved in 1 pint tincture of orange.

Dose— $\frac{1}{2}$ to 1 dr.

Vinum Quininæ, 1 gr. in 1 oz.

A golden, sherry-coloured liquid, prepared by dissolving quinine hydrochloride 20 grs. in orange wine 1 pint.

Dose— $\frac{1}{2}$ to 1 oz.

QUININÆ HYDROCHLORIDUM ACIDUM,

$C_{20}H_{24}N_2O_2, 2HCl, 3H_2O$.

The acid hydrochloride of an alkaloid, from the same source as the hydrochloride, in the form of a white crystalline powder. *Soluble in less than its own weight of water.*

Action and dose same as the Hydrochloride.

QUININÆ SULPHAS $\{(C_{20}H_{24}N_2O_2)_2, H_2SO_4\}_2, 15H_2O$.

The sulphate of an alkaloid obtained from the same source as the hydrochloride. In filiform, silky, snow-white crystals, which should not contain more than 3 per cent. of crystals of impure cinchonidine. *Soluble in 800 parts of water.*

Tonic, Antiperiodic, Antineuralgic, and Antipyretic.

Dose—1 to 10 grs. Used in making Syr. Ferri Phos. c. Quin. et Strych.

Pilula Quininæ Sulphatis, 5 in 6.

A white semisolid obtained by mixing 30 grs. quinine sulphate with 1 gr. tartaric acid, and making a mass with a mixture of 4 grs. glycerin and 1 gr. tragacanth.

Dose—2 to 8 grs.

Tinctura Quininæ Ammoniata, 1 in 50.

A colourless liquid, prepared by dissolving quinine sulphate 175 grs. in solution of ammonia 2 ozs. and alcohol (60 per cent.) 18 ozs.

Dose— $\frac{1}{2}$ to 1 dr., freely diluted.

Ferri et Quininæ Citras, 6 grs. contain 1 gr. quinine. (See under Ferrum, p. 226.)

RESINA (Resin)—From Coniferæ.

The residue left after the distillation of the oil of turpentine from the crude oleo-resin (turpentine) of various species of Pinus, in translucent, yellowish, brittle, shining masses.

Used chiefly for its adhesive qualities in 8 Plasters, and in

Emplastrum Resinæ, 1 in 9 $\frac{1}{2}$.

(Synonym—Adhesive Plaster.)

A pale yellow solid, prepared by melting together resin 4 ozs., lead plaster 32 ozs., and hard soap 2 ozs.

It enters into 3 Plasters.

Unguentum Resinæ, 1 in 4 nearly.

A yellowish-brown, stiff ointment, prepared by melting together resin 8 ozs., yellow beeswax 8 ozs., olive oil 8 ozs., and lard 6 ozs. Often called Basilicon ointment.

A good Stimulating Application to indolent ulcers.

RHEI RADIX (Rhubarb Root)—Polygonaceæ.

The erect rhizome or so-called root, deprived of its bark and dried, of Rheum Palmatum and R. officinale, and probably other species, from China and Thibet. In hard, compact, yellow, irregularly rounded pieces bored with a hole, with a marbled fracture exhibiting starlike spots; odour peculiar and aromatic.

Its active principle is allied to Cathartic Acid, being an

Anthracene body or Anthraquinone derivative. Also contains Rheo-tannic Acid, Chrysophanic Acid, and Emodin.

Stomachic, Tonic, and Cathartic.

Dose—3 to 10 grs. for repeated administration ; 15 to 30 grs. for single dose ; 3 grs. for a child 1 year old.

Extractum Rhei.

A brown dry solid, prepared by exhausting rhubarb root with alcohol (60 per cent.), and evaporating the tincture to dryness.

Dose—2 to 8 grs.

Infusum Rhei, 1 in 20 ($\frac{1}{4}$ hour).

1 oz. rhubarb root sliced infused in 1 pint boiling water.

Dose— $\frac{1}{2}$ to 1 oz.

Liquor Rhei Concentratus, 1 in 2.

A dark brown liquid, prepared by macerating and percolating 10 ozs. coarsely-powdered rhubarb root with alcohol (20 per cent.) to produce 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

Pilula Rhei Composita, 1 in 4 nearly.

A brownish-red pill mass, prepared by beating together rhubarb root 3 ozs., Socotrine aloes $2\frac{1}{4}$ ozs., myrrh and hard soap of each $1\frac{1}{2}$ ozs., oil of peppermint $1\frac{1}{2}$ drs., syrup of glucose $2\frac{3}{4}$ ozs.

Dose—4 to 8 grs.

Pulvis Rhei Compositus, 1 in $4\frac{1}{2}$.

(Synonym—Gregory's Powder.)

A pale yellow powder, turning red when moistened, prepared by rubbing together rhubarb root 2 ozs., light or heavy magnesia 6 ozs., ginger 1 oz.

Antacid, Stomachic, and Cathartic.

Dose—20 to 60 grs., in milk. For a child 1 year old, 5 grs.

Syrupus Rhei, 1 in 15.

A brown thick liquid, prepared by exhausting 2 ozs. each rhubarb root and coriander fruit with distilled water 24 ozs. and alcohol (90 per cent.) 8 ozs., evaporating to 14 ozs., adding 24 ozs. sugar, and dissolving with gentle heat.

Dose— $\frac{1}{2}$ to 2 drs. ; $\frac{1}{2}$ dr. for a child 1 year old.

Tinctura Rhei Composita, 1 in 10.

A dark brown liquid, prepared by percolating with alcohol (60 per cent.), rhubarb root 2 ozs., cardamoms, freed from their pericarps, and coriander, of each $\frac{1}{4}$ oz., till 18 ozs. are obtained, and mixing this with 2 ozs. glycerin.

Dose— $\frac{1}{2}$ to 1 dr. for repeated administration ; 2 to 4 drs. for single dose.

RHŒADOS PETALA (Red Poppy Petals)—Papaveraceæ.

The fresh, scarlet-coloured petals of *Papaver Rhœas* ; used only as a colouring agent.

Syrupus Rhœados, 1 in 3½.

A rich red syrup, prepared by making an infusion of 13 ozs. fresh red poppy petals with distilled water 1 pint on a water-bath, and in this dissolving sugar 2½ lbs., and adding alcohol (90 per cent.) 2½ ozs. Product, 3 lbs. 10 ozs.

Dose—½ to 1 dr. (Used to colour mixtures.)

RICINI OLEUM (Castor Oil)—From Euphorbiaceæ.

The viscid, almost odourless and colourless oil expressed from the seeds of *Ricinus communis*. The active principle is Ricinoleic Acid, which is formed on saponification of the oil. (The poisonous Ricin exists only in the seeds.)

Cathartic. Dose—1 to 8 drs. For a child 1 year old, 1 dr.

Enters into Collodium Flexile, Linimentum Sinapis Co., and Pil. Hydrarg. Subchlor. Co., and

Mistura Olei Ricini, 3 drs. in 1 oz.

Prepared by mixing gradually and alternately castor oil 3 ozs. and a mixture of orange-flower water (undiluted) 1 oz. and cinnamon water 2½ ozs. with mucilage of gum acacia 1½ ozs.

Cathartic. Dose—As a draught, 1 to 2 ozs.

ROSÆ AQUA (Rose Water)—From Rosaceæ.

The rose water of commerce, prepared by distillation from the flowers of *Rosa damascena* (The Damask Rose). It is a saturated solution of the essential oil of the flowers, and is to be diluted immediately before use with twice its volume of water.

IN—Mist. Ferri Co., and Rose basis for lozenges.

Unguentum Aquæ Rosæ (Rose Water Ointment).

A white ointment, commonly known as "cold cream," made by melting together white beeswax and spermaceti, of each 1½ ozs., and almond oil 9 ozs., adding gradually rose water 7 ozs. (undiluted) and oil of rose 8 mins.

A fragrant Emollient.

ROSÆ OLEUM (Oil of Rose)—From Rosaceæ.

(Synonym—Otto of Rose.)

The fragrant, pale yellow, crystalline, semisolid oil distilled from the fresh flowers of *Rosa damascena* (The Damask Rose).

A powerful Odorant—used in Ung. Aq. Rosæ.

ROSÆ GALLICÆ PETALA (Red-Rose Petals)—Rosaceæ.

The purplish-red, unexpanded, velvety petals, fresh and dried, of *Rosa gallica*, from cultivated plants.

Astringent; chiefly used on account of their colouring.

Confectio Rosæ Gallicæ (Confection of Roses)—1 in 4.

A soft violet-coloured mass, prepared by beating *fresh* red-rose petals 1 lb. with sugar 3 lbs.

Used as an excipient for pill masses.

It enters into 3 pills bearing the name of Aloes, and into Pil. Hydrarg.

Infusum Rosæ Acidum, 1 in 40 ($\frac{1}{4}$ hour).

A bright red liquid, prepared by infusing *dried* red-rose petals $\frac{1}{2}$ oz. in boiling water 1 pint and diluted sulphuric acid 2 drs.

Astringent. Dose— $\frac{1}{2}$ to 1 oz.

Syrupus Rosæ, 1 in 17.

A red syrup, prepared from 2 ozs. *dried* red-rose petals by making an infusion with 1 pint boiling distilled water (for 2 hours), squeezing through calico, heating to the boiling point, filtering, adding 30 ozs. sugar, and dissolving with gentle heat.

Dose— $\frac{1}{2}$ to 1 dr. Chiefly used for its bright red colour.

ROSMARINI OLEUM (Oil of Rosemary)—From Labiataæ.

The colourless or pale yellow oil distilled from the flowering tops of *Rosmarinus officinalis*.

Stimulant and Rubefacient. Dose— $\frac{1}{2}$ to 3 mins.

It enters into Liniment. Saponis and Tr. Lavand. Co., and the following :—

Spiritus Rosmarini, 1 in 10.

A colourless liquid, consisting of oil of rosemary 1 oz., dissolved in alcohol (90 per cent.) to 10 ozs.

SACCHARUM LACTIS (Milk Sugar), $C_{12}H_{22}O_{11}, H_2O$.

(Synonym—Lactose.) In white crystals or crystalline masses, obtained from the whey of milk.

Diuretic, and Sedative to the stomach, but generally used to dilute powders, as in Pulvis Elaterini Co.

SACCHARUM PURIFICATUM, $C_{12}H_{22}O_{11}$ (Refined Sugar).

(Synonym—Sucrose.)

Colourless, inodorous, separate crystals, obtained from the juice of the sugar-cane. Used for its sweetening properties.

It enters into all the syrups and lozenges, 3 of the confections, some mixtures, pills, and powders, into Liq. Calcis Sac., Sodii Citro-Tart. Effervescens, and Mag. Sulph. Effervescens.

Syrupus, 2 of sugar and 1 of water, or 1 in $1\frac{1}{8}$.

A thick, colourless liquid, prepared by dissolving sugar 5 lbs. in distilled water $2\frac{1}{2}$ lbs. Its specific gravity is 1.330, which is about the average density of the syrups.

It enters into Creosote Mixture, Pill of Iron, 9 syrups, and Confection of Sulphur.

Syrupus Aromaticus (Aromatic Syrup).

A pale straw-coloured syrup, prepared by mixing tincture of orange and cinnamon water of each 5 ozs., shaking with powdered talc, filtering and adding syrup 10 ozs.

Used for Flavouring mixtures. Dose— $\frac{1}{2}$ to 1 dr.

SALICINUM (Salicin), $C_6H_{11}O_5OC_6H_4CH_2OH$ —Salicaceæ.

A crystalline glucoside, in small, shining, colourless crystals, obtained from the bark of various species of *Salix* and of *Populus*.

Acts like *Sodii Salicylas*. Dose—5 to 20 grs.

SALOL (Salol), $C_6H_4.OH.COOC_6H_5$.

Insoluble, colourless crystals of phenyl salicylate, prepared by the interaction of salicylic acid and phenol, or of their sodium salts with phosphoryl chloride or carbonyl chloride.

An Intestinal Antiseptic and Analgesic. Dose—5 to 15 grs.

SAMBUCI FLORES (Elder Flowers)—Caprifoliaceæ.

The small, white flowers of *Sambucus nigra*, separated from the stalks. Contain Volatile Oil, Valerianic Acid, and a Resin. Seldom employed, except as a Cosmetic to remove freckles.

Aqua Sambuci, 1 in 1.

A colourless water, prepared by mixing fresh elder flowers 10 lbs. with water 5 galls., and distilling 1 gall. May be made with an equivalent quantity of the preserved flowers.

A fragrant basis for skin lotions.

SANTALI OLEUM (Oil of Sandal Wood)—Santalaceæ.

(Synonym—Oil of Santal Wood.) The thick pale yellow, aromatic oil distilled from the wood of *Santalum album*.

Active principle—Santalol, which is an alcohol, and some Santatal. Diuretic; like *Copaiba*. Dose—5 to 30 mins.

SANTONINUM (Santonin), $C_{15}H_{18}O_3$.

The active principle of *santonica*—the dried, unexpanded flower-heads or capitula of *Artemisia Maritima*, var. *Stechmanniana*, in minute, colourless, flat, rhombic prisms, becoming yellow on exposure to light.

Anthelmintic—killing the round and thread worms.

Dose—For an adult, 2 to 5 grs.; for a child 1 year, $\frac{1}{2}$ to

$\frac{3}{4}$ gr. ; for a child 2 or 3 years old, 2 grs. ; and above 4 years, 3 grs.

It should, if possible, always be given in a teaspoonful of castor oil, which greatly increases its efficacy and safety.

Trochiscus Santonini, 1 gr. in each.

A white or yellowish-white lozenge, composed of santonin, with simple basis.

SAPO ANIMALIS (Curd Soap).

The white or greyish-white, horny, and nearly inodorous brittle soap made with sodium hydroxide and a purified animal fat, consisting principally of stearin ; contains 30 per cent. water.

Mildly Laxative, but chiefly used for its physical qualities.

IN—Ext. Col. Co., Lin. Pot. Iod. C. Sapone, and Pil. Scammonii Co.

SAPO DURUS (Hard Soap).

The dry, greyish-white soap, in appearance resembling curd soap, but made with olive oil and sodium hydroxide. It is an oleate of soda.

Antacid and Laxative. Dose—5 to 15 grs., in pill.

Enters into 7 pill masses, Emp. Resinæ, Hydrarg. Oleas, and Ungt. Zinci Oleatis.

Emplastrum Saponis, 1 of soap in 7.

A white solid, prepared by melting hard soap 6 ozs., resin 1 oz., and lead plaster $2\frac{1}{4}$ lbs., stirring and evaporating.

A useful strapping for swollen joints ; acts mechanically.

Enters into Empl. Calefaciens and Empl. Cantharidis.

Pilula Saponis Composita, 1 gr. opium in 5.

Prepared by beating together powdered opium $\frac{1}{2}$ oz., hard soap $1\frac{1}{2}$ ozs., syrup of glucose $\frac{1}{2}$ oz.

Narcotic. The name Pil. Saponis Co. is used to disguise its composition. Dose—2 to 4 grs.

SAPO MOLLIS (Soft Soap).

The yellowish-green, inodorous jelly, made with olive oil and potassium hydroxide, being an oleate of potassium.

Used in making Turpentine Liniment, and

Linimentum Saponis, 1 in 12.

A clear, straw-coloured liquid, prepared by mixing and letting stand for 7 days soft soap 2 ozs., camphor 1 oz., and oil of rosemary 3 drs., in alcohol (90 per cent.) 16 ozs., diluted with distilled water 4 ozs.

A Stimulating Application to bruises and sprains ; sometimes called "Opodeldoc."

Enters into Linimentum Opii.

SARSÆ RADIX (Sarsaparilla)—Smilacææ.

The dried, long, slender, reddish-brown root, covered with rootlets, of *Smilax ornata*, imported from Costa Rica, and commonly known as Jamaica sarsaparilla. It contains Sarsaponin, Parillin, and Saponin.

An Alterative and Diaphoretic.

Extractum Sarsæ Liquidum, 1 in 1.

A deep coffee-brown liquid, prepared by exhausting 20 ozs. sarsaparilla in 3 portions with alcohol (20 per cent.), using the percolate from the first to exhaust the second, and that from the second to exhaust the third. The third percolate is to measure 18 ozs., and 2 ozs. glycerin should be added to it.

Dose—2 to 4 drs.

Liquor Sarsæ Compositus Concentratus, 1 in 1.

A dark brown liquid, prepared by infusing sarsaparilla 20 ozs. in 3 successive portions (of 5 pints each) of water at 160° F.; also boiling sassafras root, guaiacum wood, dried liquorice root, of each 2 ozs., and mezereon bark 1 oz. with water till exhausted, mixing the two liquids and evaporating to 16 ozs., and adding 4½ ozs. alcohol (90 per cent.).

Dose—2 to 8 drs.

SASSAFRAS RADIX (Sassafras Root)—Lauracææ.

The dried, brown root (in chips or shavings) of *Sassafras officinale*, in pieces covered with rusty brown bark.

Active principles—Two Volatile Oils and Sassafras Camphor. Diaphoretic. Used only to flavour *Liquor Sarsæ Co. Conc.*

SCAMMONIÆ RADIX (Scammony Root)—Convolvulacææ.

The dried, hard, tap-shaped roots, brownish-grey without, light or dark grey within, of *Convolvulus Scammonia*.

A griping Cathartic. (It contains the Resin and Gum Resin.)

SCAMMONIÆ RESINA (Scammony Resin).

The brownish, translucent, brittle, resinous solid, prepared by exhausting scammony root with alcohol (90 per cent.), adding water (which throws down the resin), and then distilling off the alcohol and washing and drying the residue. It may be similarly prepared from scammony. Composed chiefly of Jalapin.

Dose—3 to 8 grs., in pill or powder, or rubbed up with milk.

It enters into *Pil.* and *Extract. Colocynth. Co.* and the following:—

Pilula Scammonii Composita, 1 in 3 nearly.

Prepared by dissolving resins of scammony and jalap of each 1 oz., curd soap 1 oz., in tincture of ginger 3 ozs., and evaporating to a proper consistence.

Cathartic. Dose—4 to 8 grs

Pulvis Scammonii Compositus, 1 in 2.

A brown powder, prepared by mixing and sifting scammony resin 4 ozs., jalap 3 ozs., and ginger 1 oz.

An active Hydragogue Cathartic.

Dose—10 to 20 grs. 1 to 2 grs. for a child 1 year old.

SCAMMONIUM (Scammony).

A gum resin, obtained by incising the *living* root of *Convolvulus Scammonia*, in ash-grey and rough, cinder-like irregular fragments, with a black, shining, splintery, resinous fracture. Known as Virgin Scammony, and used as a source of the Resin.

A powerful Cathartic. Dose—5 to 10 grs.

SCILLA (Squill)—Liliaceæ.

The dried, sliced, pear-shaped bulb of *Urginea Scilla*, divested of its outer scales; in dried, yellowish-white, tough, curved, dampish fragments or slices.

Active principles—Scillitoxin or Scillain and Scillipicrin.

Diuretic and Expectorant. Dose—1 to 3 grs.

Acetum Scillæ, 1 in 8.

A pale, straw-coloured liquid, prepared by macerating squill $2\frac{1}{2}$ ozs. in dilute acetic acid 1 pint.

Dose—10 to 30 mins.; generally given as Syr. Scillæ.

Oxymel Scillæ, about 1 in 15.

A thick, opalescent, brownish liquid, prepared by macerating for 7 days squill $2\frac{1}{2}$ ozs. in acetic acid $2\frac{1}{2}$ ozs. and water 8 ozs. The product (about 10 ozs.) is mixed with liquefied clarified honey 27 ozs. or q.s. to give S.G. 1.32.

Dose—1 to 2 drs., as an Expectorant.

Pilula Scillæ Composita, 1 in 4 nearly.

A whitish semisolid, prepared by mixing and beating into a uniform mass squill $1\frac{1}{4}$ ozs., ginger, ammoniacum, hard soap (all in fine powder), and syrup of glucose, of each 1 oz.

Dose—4 to 8 grs., as an Expectorant or Diuretic.

Syrupus Scillæ, about 1 of squill in 17.

A thick straw-coloured liquid, prepared by dissolving sugar 38 ozs. in vinegar of squill 1 pint.

Dose— $\frac{1}{2}$ to 1 dr., as an Expectorant; 1 oz., as an Emetic.

For a child 1 year old, 5 mins.; as an Emetic, $\frac{1}{2}$ to 1 dr.

As it contains acetic acid, it should not be ordered with alkalis. It is sometimes ordered by mistake with Spt. Ammon. Aromat.

Tinctura Scillæ, 1 in 5.

A straw-coloured liquid, prepared by macerating bruised squill 4 ozs. in alcohol (60 per cent.) 1 pint.

Dose—5 to 15 mins.

Pilula Ipecacuanhæ cum Scilla. (*Vide* Ipecacuanha.)

It contains 1 part of opium, 1 of ipecacuanha, $3\frac{1}{3}$ of squill, and $3\frac{1}{3}$ of ammoniacum in 20 parts.

SCOPARII CACUMINA (Broom Tops)—Leguminosæ.

The fresh and dried tops, with their straight, angular, dark-green, smooth twigs, of *Cytisus scoparius*.

Active principles—Scoparin and Sparteine.

Diuretic ; in large dose, Cathartic.

Infusum Scoparii, 1 in 10 ($\frac{1}{4}$ hour).

Prepared by infusing bruised, dried broom tops 2 ozs. in boiling water 1 pint.

Dose—1 to 2 ozs.

Succus Scoparii.

The brown juice obtained by bruising fresh broom tops in a stone mortar, and adding to every 3 measures of the fresh juice 1 measure of alcohol (90 per cent.), setting aside and filtering.

Dose—1 to 2 drs.

SENEGÆ RADIX (Senega Root)—Polygalacæ.

The dried, yellowish-brown contorted root of *Polygala Senega*, from $\frac{1}{5}$ to $\frac{1}{3}$ inch in thickness, with a keel along the whole extent of its inner or concave side. (See under Valerian.)

A Stimulating Expectorant.

Active principle—Senegin, which is identical with Saponin.

Infusum Senegæ, 1 in 20 ($\frac{1}{2}$ hour).

Prepared by infusing senega root in No. 10 powder 1 oz. in boiling distilled water 1 pint.

Dose— $\frac{1}{2}$ to 1 oz. Used as a basis for cough mixtures.

Liquor Senegæ Concentratus, 1 in 2.

A dark brown liquid, prepared by macerating and percolating 10 ozs. senega root with 25 ozs. of a mixture of 2 parts of alcohol (20 per cent.) and 1 part of alcohol (45 per cent.) ; the product to measure 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

Tinctura Senegæ, 1 in 5.

A brown, sherry-coloured liquid, prepared by percolating senega root 4 ozs. in No. 40 powder with alcohol (60 per cent.) to produce 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

SENNA ALEXANDRINA (Alexandrian Senna)—Leguminosæ.

The greyish-green, lanceolate, acute leaflets, $\frac{3}{4}$ to 1 inch long, and unequally divided at the bases, of *Cassia acutifolia*. They

are sometimes adulterated with Argel leaves, which are bitter, and have not an unequal oblique base.

Active principles—Cathartic Acid, or Anthracene bodies similar to those existing in cascara, rhubarb, and aloes, with Emodin and Chrysophanic Acid.

Cathartic. Dose—10 to 30 grs.

SENNA INDICA (East Indian Senna)—Leguminosæ.

(Synonym—Tinnivelly Senna.) The green, lanceolate, acute leaflets of *Cassia angustifolia*, 1 to 2 inches long, with an unequal and oblique base. From plants cultivated in South India.

May be used instead of Alexandrina senna (which it resembles in dose and action) to make any of the following preparations :—

Confectio Sennæ, 1 in 11.

A soft blackish mass, composed of powdered senna 7 ozs., powdered coriander 3 ozs., figs 12 ozs., tamarinds 9 ozs., cassia pulp 9 ozs., prunes 6 ozs., extract of liquorice 1 oz., sugar 30 ozs., distilled water 24 ozs. or q.s. ; prepared by boiling the figs and prunes in the water, adding the tamarind and cassia, rubbing the pulp through a sieve, in this dissolving the sugar and extract of liquorice and adding the powders, making the weight up to 75 ozs. with distilled water. Called "Lenitive electuary."

Laxative and Cathartic. Dose—60 to 120 grs.

Infusum Sennæ, 1 in 10 ($\frac{1}{4}$ hour).

Prepared by infusing senna 2 ozs. and ginger 55 grs. in boiling distilled water 1 pint.

Dose— $\frac{1}{2}$ to 1 oz. As a draught, 2 ozs.

Enters into Mist. Sennæ Co.

Liquor Sennæ Concentratus, 1 in 1.

A black liquid, prepared by macerating and percolating 20 ozs. senna in 3 portions with distilled water, using the percolate from the first portion to exhaust the second, and that from the second to exhaust the third. The percolate from the third is to measure 16 ozs., and to this is added tincture of ginger 2 $\frac{1}{2}$ ozs., and alcohol (90 per cent.) 2 ozs.

Dose— $\frac{1}{2}$ to 1 dr.

Mistura Sennæ Composita, 1 of MgSO_4 in 4.

(Synonym—Black Draught.)

An almost black liquid, consisting of magnesium sulphate 5 ozs., liquid extract of liquorice 1 oz., aromatic spirit of ammonia 1 oz., compound tincture of cardamoms 2 ozs., infusion of senna to make 1 pint.

Hydragogue Cathartic. Dose—as a draught, 1 to 2 ozs.

Syrupus Sennæ, 1 in 2.

A deep, brownish-black liquid, prepared by percolating and repercolating 40 ozs. of senna in coarse powder with distilled water and alcohol (20 per cent.) and evaporating to produce 40 ozs. percolate, heating to 180° F. for 10 minutes ; cooling, filtering, and dissolving at a gentle heat in the filtrate 50 ozs. sugar, and finally, after cooling, adding 10 mins. oil of coriander dissolved in 40 mins. of alcohol (90 per cent.).

A mild Cathartic.

Dose— $\frac{1}{2}$ to 2 drs. A child 1 year old may get $\frac{1}{4}$ to $\frac{1}{2}$ dr.

Tinctura Sennæ Composita, 1 in 5.

A dark liquid, prepared by macerating in 1 pint of alcohol (45 per cent.) the following :—Senna 4 ozs., raisins freed from seeds 2 ozs., caraway and coriander of each $\frac{1}{2}$ oz.

Dose— $\frac{1}{2}$ to 1 dr. for repeated administration ; 2 to 4 drs. for single dose.

Pulvis Glycyrrhizæ Compositus, 1 of senna in 6. (See Glycyrrhiza.)**SERPENTARIÆ RHIZOMA** (Serpentary Rhizome)—Aristolochiaceæ.

The small, round, knotty, yellowish-white, dried rhizome, with numerous slender rootlets, of Aristolochia Serpentina or of A. reticulata. The rhizome of the latter is a little thicker and the rootlets larger and less matted. (See under Valerian.)

Diaphoretic.

It enters into Tinct. Cinchonæ Co. and the following :—

Infusum Serpentariæ, 1 in 20 ($\frac{1}{4}$ hour).

Prepared by infusing serpentary rhizome 1 oz. in boiling distilled water 1 pint.

Dose— $\frac{1}{2}$ to 1 oz.

Liquor Serpentariæ Concentratus, 1 in 2.

A dark brown liquid, prepared by exhausting 10 ozs. serpentary rhizome with 25 ozs. alcohol (20 per cent.) to produce 1 pint.

Dose— $\frac{1}{2}$ to 2 drs.

Tinctura Serpentariæ, 1 in 5.

A brown liquid, prepared by percolating serpentary in No. 40 powder 4 ozs. with alcohol (70 per cent.) to produce 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

SEVUM PRÆPARATUM (Prepared Suet).

The white, smooth, internal fat of the abdomen of the sheep—Ovis Aries—purified by melting and straining.

Used to give proper consistence to Ungt. Hydrarg.

SINAPIS (Mustard)—Cruciferæ.

Black and white mustard seeds, powdered and mixed, forming a greenish-yellow acrid powder.

Active principle is essential Oil of Mustard, obtained by the action of a ferment (Myrosin) present in the seeds upon the glucosides Sinalbin, and Sinigrin upon the addition of water.

Emetic and Stimulant. Externally—Rubefacient.

Sinapis Albæ Semina (White Mustard Seed).

The hard, round, pale yellow, finely-pitted, dried, ripe seeds (1 line in diameter) of *Brassica alba*.

Sinapis Nigræ Semina (Black Mustard Seed).

The dark, reddish-brown or greyish-brown, round, hard, dried, ripe seeds ($\frac{1}{2}$ a line in diameter) of *Brassica nigra*.

Charta Sinapis.

Prepared by extracting the fixed oil from equal weights of bruised black and white mustard seeds with benzol, drying and powdering the residue, and mixing 75 grs. with 5 drs. solution of indiarubber, and coating over with the semifluid mixture one surface of strips of cartridge paper. Before being applied, they should be dipped for a few seconds into tepid water.

Counter-irritant and Rubefacient.

Oleum Sinapis Volatile.

The pale yellow pungent oil distilled from the seeds of *Black* mustard after maceration with water. It consists principally of Allyl-isosulpho-cyanate.

A powerful Irritant, producing instant Vesication.

Linimentum Sinapis, 1 in 27.

An almost colourless liquid, prepared by adding oil of mustard $1\frac{1}{2}$ drs. to castor oil 5 drs., and adding the mixture to camphor 120 grs., dissolved in alcohol (90 per cent.) 4 ozs.

A Stimulating and Rubefacient Application.

SODA TARTARATA (Sodium Potassium Tartrate).

$(\text{CHOH})_2, \text{COONa}, \text{COOK}, 4\text{H}_2\text{O}$.

(Synonyms—Tartrate of Potassium and Sodium ; Rochelle Salt ; Tartarated Soda.) Colourless, transparent, rhombic prisms or a white powder readily soluble in water ; prepared by neutralising acid potassium tartrate with sodium carbonate.

A Hydragogue Cathartic.

Dose—120 to 240 grs. Lemonade makes an agreeable vehicle.

Pulvis Sodæ Tartaratæ Effervescens (Effervescent Tartarated Soda Powder). Commonly called Seidlitz Powder.

Consists of 120 grs. tartarated soda and 40 grs. sodium bicarbonate, in a blue paper, to be dissolved in nearly $\frac{1}{2}$ pint of cold or warm water, taken in effervescence with 38 grs. tartaric acid (in a white paper).

Sodii Arsenas (Sodium Arsenate), Na_2HAsO_4 .

(Arseniate of Sodium (hydrous), B.P., 1885.) Di-sodium hydrogen arsenate—a white anhydrous powder, soluble in 4 parts of water, obtained by exposing to a temperature of 300°F . crystallised sodium arsenate which may be prepared by treating with water the product of the fusion of arsenious anhydride with sodium nitrate and sodium carbonate.

Alterative and Tonic. Dose— $\frac{1}{40}$ to $\frac{1}{10}$ gr.

Liquor Sodii Arsenatis, 1 gr. in 110 mins.

A colourless solution of sodium arsenate (rendered anhydrous by a heat under 300°F .) $17\frac{1}{2}$ grs. in distilled water 4 ozs.

Dose—2 to 8 mins., diluted, after meals.

Sodii Benzoas, $\text{C}_6\text{H}_5\text{COONa}$.

A white powder, inodorous or having a faint benzoic odour, obtained by neutralising benzoic acid with sodium carbonate.

Diuretic. Dose—5 to 30 grs.

Sodii Bicarbonas, NaHCO_3 .

In white powder, or small opaque, white crystals, soluble in 12 times their weight of water, prepared by saturating sodium carbonate with carbonic anhydride; or by the reaction of sodium chloride and ammonium bicarbonate. It is known as "Baking Soda."

Antacid. Dose—5 to 30 grs., in solution; 20 grs. make an effervescing draught with $\frac{1}{2}$ oz. lemon juice. (See Citric Acid.)

20 parts are neutralised by 16.7 parts of citric acid or 17.8 of tartaric acid.

Enters into Sodii Citro-Tart. Efferves., Lithii Cit. Efferves., Pulv. Sodæ Tart. Efferves., Sodii Phosph. Efferves., Sodii Sulph. Efferves., Mag. Sulph. Efferves., and the following :—

Trochiscus Sodii Bicarbonatis, 3 grs. in each.

White lozenges, composed of sodium bicarbonate and rose basis.

Sodii Bromidum, NaBr .

A granular, somewhat deliquescent, white powder, consisting of cubic crystals, obtained by adding bromine to sodium hydroxide till a permanent brown tint remains, evaporating to

dryness, fusing with charcoal, dissolving out the bromide of sodium, and crystallising from warm solutions.

Antispasmodic. Sedative like KBr. Dose—5 to 30 grs.

Sodii Carbonas, $\text{Na}_2\text{CO}_3, 10\text{H}_2\text{O}$.

In large, transparent, colourless, rhombic crystals, soluble in less than twice their weight of water, obtained from sodium chloride, either by reaction with ammonium bicarbonate and ignition, or by conversion into sulphate, adding carbon and calcium carbonate and heating. It is known as "Washing Soda."

Antacid. 20 grs. neutralise about 9·8 of citric acid ; or 10·5 of tartaric acid.

Dose—5 to 30 grs., in dilute solution.

Used in making Ext. Ergotæ ; and from it all of the sodium salts can be artificially obtained.

Sodii Carbonas Exsiccatus (Exsiccated Sodium Carbonate), Na_2CO_3 .

(Dried Carbonate of Sodium, B.P., 1885.)

A white powder, obtained by strongly heating sodium carbonate until it loses 63 per cent. of its weight, and reducing the residue to powder. It only differs from the crystallised carbonate in being devoid of water of crystallisation, and is nearly three times stronger (3 grs. = 8 grs.).

Dose—3 to 10 grs., in pill or powder.

Sodæ Chlorinatæ Liquor, $2\frac{1}{2}$ per cent. Cl.

A colourless solution, prepared by dissolving 24 ozs. sodium carbonate in 40 ozs. water, and adding 16 ozs. chlorinated lime mixed with 6 pints water, and filtering.

Antiseptic and Disinfectant. Dose—10 to 20 mins., diluted. As a gargle, $\frac{1}{2}$ dr. to 1 oz. water ; as a lotion, 1 dr. to 1 oz. water.

Sodii Chloridum, NaCl.

In small crystalline grains, or in transparent cubical crystals, generally obtained by purifying common salt.

Purgative, Emetic, and Anthelmintic.

Dose— $\frac{1}{2}$ to 1 oz.

Used in making Hydrochloric Acid, Calomel, and Corrosive Sublimite.

Sodii Citro-Tartras Effervescens.

A white granular powder, being a mechanical mixture of sodium bicarbonate 51 ozs., tartaric acid 27 ozs., citric acid 18 ozs., sugar 15 ozs., all in powder, heated between 200° and 220° F. until the particles begin to aggregate, and then assiduously stirred till they become granulated.

Dose—60 to 120 grs. as a Refrigerant and Laxative.

Sodii Ethylatis Liquor (18 per cent. $\text{NaC}_2\text{H}_5\text{O}$).

A colourless or brownish, syrupy liquid, prepared by dissolving 22 grs. pure metallic sodium in 1 oz. absolute alcohol. Should be recently prepared.

Caustic ; painted over nævoid and cancerous growths.

Sodii Hypophosphis, NaPH_2O_2 .

A white, granular powder, or in colourless prismatic crystals, soluble in its own weight of water, obtained by interaction of sodium carbonate and calcium hypophosphite.

Nervine Tonic and Restorative. Dose—3 to 10 grs.

Sodii Iodidum, NaI .

A white crystalline powder, prepared like iodide of potassium by using sodium hydroxide instead of potassium hydroxide.

Alterative ; like KI. Dose—5 to 20 grs.

Sodii Nitris, NaNO_2 .

A white, deliquescent, crystalline salt, very soluble in water, obtained by fusing sodium nitrate with metallic lead.

Vaso-dilator, like Amyl Nitrite. Dose—1 to 2 grs.

Sodii Phosphas, $\text{Na}_2\text{HPO}_4, 12\text{H}_2\text{O}$.

In large, transparent, colourless, rhombic prisms, soluble in 6 times their weight of water, prepared by the interaction of sodium carbonate and a solution of acid calcium phosphate produced on mixing bone ash with sulphuric acid.

Purgative and Diuretic.

Dose—30 to 120 grs. for repeated administration ; for single dose, $\frac{1}{4}$ to $\frac{1}{2}$ oz.

Used in making Ferri Phosph., and—

Sodii Phosphas Effervescens, 1 in 2.

A granular powder, being a mechanical mixture, prepared by heating 50 ozs. sodium phosphate, and adding to it 50 ozs. sodium bicarbonate, 27 ozs. tartaric acid, and 18 ozs. citric acid, heating between 200° and 220° F., and stirring assiduously till granulation takes place. The product should weigh 100 ozs.

Aperient and Antacid.

Dose—60 to 120 grs. for repeated administration ; $\frac{1}{4}$ to $\frac{1}{2}$ oz. for single dose.

Sodii Salicylas ($\text{C}_6\text{H}_4, \text{OH}, \text{COONa}$) $_2\text{H}_2\text{O}$.

In small, colourless, crystalline scales, obtained by the action of salicylic acid on sodium carbonate or sodium hydroxide, and soluble in an equal weight of water.

Antipyretic, Antirheumatic, Diuretic. Dose—10 to 30 grs.

Sodii Sulphas, $\text{Na}_2\text{SO}_4, 10\text{H}_2\text{O}$.

In large, transparent, monoclinic, efflorescent prisms, soluble in three times their weight of water ; may be obtained by interaction of sodium chloride and other sodium salts with sulphuric acid. Known as Glauber's Salt.

Hydragogue Cathartic.

Dose—30 to 120 grs. for repeated administration ; $\frac{1}{4}$ to $\frac{1}{2}$ oz. for single dose.

Sodii Sulphas Effervescens, 1 in 2.

A granular white powder, being a mechanical mixture, prepared by heating 50 ozs. sodium sulphate with 50 ozs. sodium bicarbonate, 27 ozs. tartaric acid, and 18 ozs. citric acid, heating between 200° and 220° F., and stirring assiduously till granulation takes place. The product should weigh 100 ozs.

Aperient and Antacid.

Dose—60 to 120 grs. for repeated administration ; $\frac{1}{4}$ to $\frac{1}{2}$ oz. for single dose.

Sodii Sulphis, $\text{Na}_2\text{SO}_3, 7\text{H}_2\text{O}$.

Colourless, transparent, monoclinic, efflorescent prisms, obtained by the action of sulphurous acid on sodium carbonate. Very soluble in water.

Antiseptic and Antiparasitic. Dose—5 to 20 grs.

Sodii Sulphocarbolas, $\text{C}_6\text{H}_4\text{OH}, \text{SO}_2\text{ONa}, 2\text{H}_2\text{O}$.

(Sodium Sulphocarbolate or Sodium Phenol-para-sulphonate.)

Colourless, transparent, rhombic prisms, obtained by dissolving phenol in excess of sulphuric acid, and converting the phenol-sulphonic acid so obtained into a sodium salt. Soluble in 6 parts of water.

Antipyretic and Antiseptic. Dose—5 to 15 grs.

Sodium, Na.

The soft metallic element sodium, as met with in commerce, introduced into the B.P. to make Liquor Sodii Ethylatis. It should be kept in stoppered bottles, under mineral naphtha.

SPIRITUS RECTIFICATUS (Alcohol 90 per cent.), $\text{C}_2\text{H}_5\text{OH}$.

(Synonym—Rectified Spirit.) The colourless, transparent, mobile liquid, consisting of ethyl hydroxide 90 per cent. by vol. with 10 per cent. of water, obtained by the distillation of fermented saccharine fluids. S.G., '834.

1 part to 3 of water makes " Spirit Lotion."

When alcohol and water are mixed, contraction of volume and rise of temperature take place. The cooled liquid is intended in the B.P.

The following four diluted alcohols are official :—

Alcohol (70 per cent.), prepared by mixing 100 ozs. alcohol (90 per cent.) and 31 (or exactly 31.05) ozs. water.

Alcohol (60 per cent.) = 100 ozs. alcohol (90 per cent.) and 53 $\frac{2}{3}$ (53.65) ozs. water.

Alcohol (45 per cent.) = 100 ozs. alcohol (90 per cent.) and 105 $\frac{1}{3}$ (105.34) ozs. water.

Alcohol (20 per cent.) = 100 ozs. alcohol (90 per cent.) and 355 $\frac{3}{4}$ (355.8) ozs. water.

SPIRITUS VINI GALlici (Brandy).

Being the deep, straw-coloured, bright liquid, distilled from wine and matured by age, and generally containing not less than 43 $\frac{1}{2}$ per cent. by volume of ethyl hydroxide.

Mistura Spiritus Vini Gallici.

An opaque yellowish liquid, often known as Egg-flip; prepared by rubbing the yolks of two eggs with $\frac{1}{2}$ oz. sugar, and adding brandy and cinnamon water of each 4 ozs.

Nutritive, Restorative, and Narcotic.

Dose—As a draught, 1 to 2 ozs.

STAPHISAGRIÆ SEMINA (Stavesacre Seeds)—*Ranuncula-ceæ*).

The irregularly triangular, brown, dried, ripe seeds of *Delphinium Staphisagria*, with wrinkled and pitted testa.

Parasiticide. Active principles—Delphinine and Staphisagrine, existing in the oil expressed from the seeds.

Unguentum Staphisagriæ, 1 in 5.

A yellowish-brown ointment, prepared by heating 2 ozs. crushed stavesacre seeds with 8 $\frac{1}{2}$ ozs. benzoated lard on a water-bath for two hours, and straining, and melting in it 1 oz. yellow beeswax.

Parasiticide, used to destroy pediculi.

STRAMONII FOLIA (Stramonium Leaves)—*Solanaceæ*.

The dried, greyish-green, ovate, petiolate, minutely wrinkled leaves of *Datura Stramonium*. Active principle—Daturine, which consists chiefly of, or is identical with, Hyoscyamine, and some Atropine, as in belladonna.

Narcotic and Antispasmodic; chiefly used in asthma.

Tinctura Stramonii, 1 in 5.

A brown liquid, prepared by percolating stramonium leaves (powdered) 4 ozs. with alcohol (45 per cent.) to produce 1 pint.

Dose—5 to 15 mins., diluted.

STRAMONII SEMINA (Stramonium Seeds)—Solanaceæ.

The small, reniform, pitted and wrinkled, brownish-black, flattened, dried, ripe seeds of *Datura Stramonium*.

Narcotic and Antispasmodic ; chiefly used in asthma.

Active principle—Same as in leaves.

Extractum Stramonii.

The firm, blackish extract, obtained by exhausting powdered stramonium seeds by percolation with alcohol (70 per cent.), distilling off most of the alcohol and evaporating to a firm extract.

Dose— $\frac{1}{4}$ to 1 gr., in pill.

STROPHANTHI SEMINA (Strophanthus Seeds)—Loganiaceæ.

The dried, ripe seeds of *Strophanthus Kombé*, freed from their awns. $\frac{3}{8}$ inch long and $\frac{1}{6}$ inch broad, greenish-fawn, and covered with silky hairs.

Active principle—Strophanthin, a glucoside. (See under Ouabain.)

Cardiac Tonic like *Digitalis*.

Extractum Strophanthi, 1 in 2.

A brownish powder, prepared by percolating 1 oz. strophanthus seeds (dried at 110° F.) with ether in order to remove oily matter, exhausting the marc with alcohol (90 per cent.), and evaporating the resulting tincture till it begins to thicken, and then adding milk sugar to produce 2 ozs.

Dose— $\frac{1}{4}$ to 1 gr.

Tinctura Strophanthi, 1 in 40.

A yellowish liquid, prepared by macerating and percolating $\frac{1}{2}$ oz. powdered strophanthus seeds with alcohol (70 per cent.) to produce 10 ozs., filtering and making up to 1 pint with alcohol.

Dose—5 to 15 mins.

STRYCHNINA (Strychnine)— $C_{21}H_{22}N_2O_2$ —Loganiaceæ.

An alkaloid, in trimetric prisms, sparingly soluble in water, prepared from *S. Nux-Vomica* and other species of *Strychnos*.

Spinal Stimulant and Bitter Tonic. Dose— $\frac{1}{60}$ to $\frac{1}{15}$ gr.

Strychninæ Hydrochloridum, $C_{21}H_{22}N_2O_2HCl, 2H_2O$.

(Hydrochlorate of Strychnine. B.P., 1885.)

The hydrochloride of an alkaloid, obtained from *S. Nux-Vomica* and other species of *Strychnos*, in small, colourless, trimetric prisms, which readily effloresce in the air. Soluble in 35 parts water.

Dose and action like Strychnine.

Liquor Strychninæ Hydrochloridi, 1 gr. in 110 mins.

(Solution of Hydrochlorate of Strychnine, B.P., 1885.)

A colourless solution of strychnine hydrochloride $17\frac{1}{2}$ grs. in alcohol (90 per cent.) 1 oz., and distilled water q.s. to make 4 ozs.

Dose—2 to 8 mins., viz., $\frac{1}{55}$ to $\frac{1}{14}$ gr. strychnine.

STYRAX PRÆPARATUS (Prepared Storax).

Liquidambaraceæ.

A semitransparent, brownish-yellow semifluid balsam, obtained from the trunk of *Liquidambar orientalis*, purified by solution in ethylic alcohol, filtration, and evaporation.

Expectorant, used in making Tinct. Benzoini Co.

It is a true balsam, containing free Cinnamic Acid, with Styrol, Styracin, and Storesinols.

SULPHONAL $(\text{CH}_3)_2\text{C}(\text{SO}_2\text{C}_2\text{H}_5)_2$ (Sulphonal).

Dimethyl-methane-diethylsulphone in colourless, inodorous, tasteless, insoluble crystals, is a product of the oxidation of mercaptol, obtained from acetone and mercaptan.

Hypnotic. Dose—10 to 30 grs., which dissolve in 500 parts of water.

SULPHUR PRÆCIPITATUM (Precipitated Sulphur), S.

(Synonym—Milk of Sulphur.)

A greyish-yellow, soft powder, free from grittiness, prepared by treating sublimed sulphur by boiling in water with lime, and then precipitating with hydrochloric acid, washing and drying the precipitate.

Laxative. Dose—20 to 60 grs.

Sulphur Sublimatum (Sublimed Sulphur), S.

(Synonym—Flowers of Sulphur.)

A gritty, greenish-yellow or primrose-coloured powder, prepared, more or less directly, from native sulphur or sulphides.

Laxative and Antiparasitic. Dose—20 to 60 grs.

In addition to Emp. Hydrarg., Emp. Ammon. cum Hydrarg., and Pulv. Glycyrrhizæ Co., it enters into the following :—

Confectio Sulphuris, 1 in $2\frac{1}{2}$.

A soft yellow paste, prepared by rubbing together sublimed sulphur 4 ozs., acid potassium tartrate 1 oz., tragacanth 18 grs., syrup 2 ozs., tincture of orange $\frac{1}{2}$ oz., and glycerin $1\frac{1}{2}$ ozs.

Dose—60 to 120 grs.

Trochiscus Sulphuris, 5 grs. in each.

Yellow lozenges, containing precipitated sulphur, cream of tartar, sugar, gum, mucilage, and tincture of orange.

Dose—1 to 6 lozenges.

Unguentum Sulphuris, 1 in 10.

A yellow ointment, prepared by rubbing sublimed sulphur 1 oz. with benzoated lard 9 ozs.

Antiparasitic ; used in itch, etc.

Sulphuris Iodidum (Iodide of Sulphur), SI.

A greyish-black, shining solid, prepared by heating together in a flask, iodine 4 ozs. and sublimed sulphur 1 oz.

Counter-irritant and Antiparasitic.

Unguentum Sulphuris Iodidi, 1 in 25.

A brown ointment, gradually becoming black, prepared by triturating in a warmed mortar sulphur iodide 20 grs. with glycerin 20 grs., and by degrees adding benzoated lard 460 grs.

An Antiparasitic and Stimulating Application.

SUMBUL RADIX (Sumbul Root)—Umbelliferæ.

The dried, brown, spongy, transverse slices of the root of *Ferula Sumbul*. It contains a Volatile Oil, Resin, and Valerianic Acid.

Nervine Stimulant and Antispasmodic.

☞ Sumbul Root is distinguished from *Calumba*, which it slightly resembles, by its open spongy texture and strong musky odour.

Tinctura Sumbul, 1 in 10.

A brown, sherry-coloured liquid, prepared by macerating Sumbul root bruised 2 ozs. in alcohol (70 per cent.) 1 pint.

Dose— $\frac{1}{2}$ to 1 dr.

Syrupus and Syrupus Aromaticus. (See *Saccharum*.)**TAMARINDUS** (Tamarind)—Leguminosæ.

The sweet, brown, soft, fibrous pulp (containing brown, shining seeds), being the fruit of *Tamarindus Indica*, freed from the brittle outer part of the pericarp, and preserved with sugar.

Laxative and Refrigerant. Dose— $\frac{1}{2}$ to 1 oz. or more.

It enters into *Confectio Sennæ*.

TARAXACI RADIX (*Taraxacum* Root)—Compositæ.

The smooth, tapering, *fresh* tap root, and the brown, wrinkled, *dried* tap root of *Taraxacum officinale*, gathered in autumn.

Diuretic, Laxative, Tonic, and feeble Cholagogue.

Extractum Taraxaci.

A rich brown "fresh or green" extract, prepared by evaporating the expressed juice of the fresh root, as in making *Ext. Colchici*.

Dose—5 to 15 grs., in solution in water, or in pill.

Extractum Taraxaci Liquidum, 1 in 1 (*dried root*).

A dark liquid, prepared by exhausting 20 ozs. *dried* dandelion root with 2 pints alcohol (60 per cent.), pressing out 10 ozs., treating the marc with water and evaporating to 10 ozs., filtering, and mixing the liquids.

Dose— $\frac{1}{2}$ to 2 drs.

Succus Taraxaci.

A brown liquid, prepared by pressing out the juice from *fresh* dandelion root, and adding to every three measures one measure of alcohol (90 per cent.).

Dose—1 to 2 drs.

TEREBENUM (Terebene).

An aromatic colourless liquid, consisting of a mixture of dipentene and other hydrocarbons, obtained by agitating oil of turpentine with sulphuric acid until it no longer rotates a ray of polarised light, and then distilling in a current of steam.

Antiseptic, Stimulating Expectorant. Dose—5 to 15 mins.

TEREBINTHINA CANADENSIS (Canada Turpentine)—Coniferae.

(Synonym—Canada Balsam, though it is not a true balsam.)

The straw-coloured, ductile oleo-resin, or turpentine (as thick as honey), obtained from *Abies balsamea* (Balm of Gilead Fir).

Used only for its adhesive qualities.

Enters into Collodium Flexile, to which it gives toughness.

TEREBINTHINÆ OLEUM (Oil of Turpentine)—Coniferae.

The limpid, colourless oil, distilled, usually by the aid of steam, from the oleo-resin (crude turpentine) obtained from *Pinus sylvestris* and other species of *Pinus*, rectified if necessary.

Stimulant, Diuretic, Anthelmintic, and Cathartic. Externally—Rubefacient. The vapour is Astringent.

Dose—2 to 10 mins.; as an Anthelmintic, 3 to 4 drs., on sugar, or in capsules, or emulsion, or rubbed up with twice its bulk of mucilage.

Linimentum Terebinthinæ, 13 in 20.

A pale yellowish-white emulsion, prepared by dissolving camphor 1 oz. in oil of turpentine 13 ozs., adding it gradually to a mixture of soft soap $1\frac{1}{2}$ ozs., and distilled water 2 ozs., and making up to 1 pint with water.

Counter-irritant and Rubefacient.

Linimentum Terebinthinæ Aceticum, 4 in 9.

A yellow liquid, being a mixture of 4 ozs. oil of turpentine, 1 oz. glacial acetic acid, and 4 ozs. liniment of camphor. A substitute for "St. John Long's Liniment," which was made with yolk of egg.

An excellent Rubefacient.

THEOBROMATIS OLEUM (Oil of Theobroma)—Sterculiaceæ.

(Synonym—Cacao Butter.)

The yellowish, solid concrete oil, in cakes, expressed from the warm ground seeds of Theobroma Cacao. (The seeds contain an alkaloid—Theobromine—which is a diuretic, acting like caffeine.)

Used in the preparation of all the Suppositories except Glycerin.

THUS AMERICANUM (Frankincense)—Coniferæ.

The soft, yellow, opaque, tough, solid turpentine or oleo-resin scraped off the trunks of *Pinus palustris* and *Pinus Tæda*.

Externally—Stimulant.

Enters into Emp. Picis.

THYMOL (Thymol)— $C_{10}H_{13}HO$ —Labiatae and Umbelliferæ.

A crystalline substance, in large, prismatic, odorous crystals, obtained from the volatile oils of *Thymus vulgaris*, *Monarda punctata*, and *Carum copticum*. Purified by recrystallisation from alcohol.

Antiseptic and Deodorant. Dose— $\frac{1}{2}$ to 2 grs. Given in doses of 15 grs. in ankylostomiasis.

THYROIDEUM SICCCUM (Dry Thyroid).

A light, dull brown powder, which is liable to become damp and to deteriorate by exposure to air; prepared from the fresh and healthy thyroid gland of the sheep. The glands are taken from the sheep immediately upon being killed, the external fat and connective tissue are removed, and the glands cut across. Any which are abnormal are rejected. The healthy are minced, dried at 90° to 100° F., powdered, washed with petroleum spirit to remove all fat, and again dried.

Restorative in Myxœdema and Cretinism.

Dose—3 to 10 grs.

Liquor Thyroidei (Thyroid Solution), 100 mins. = 1 gland.

Prepared from the *fresh and healthy* bruised gland of the sheep, by adding 34 mins. each glycerin and solution of phenol (.5 per cent.), straining, pressing, and adding .5 per cent. solution of phenol to make 100 mins. for each entire gland used; forming a turbid liquid, with a faint pinkish tinge, free from putrescence.

Must be freshly prepared, and kept in well-stoppered bottles.

Dose—.5 to 15 mins.

TRAGACANTHA (Tragacanth)—Leguminosæ.

A whitish, gummy exudation, in ribbon-like, translucent flakes or horny, curved plates (like the parings of corns), obtained by incising *Astragalus gummifer* and other species of living *Astragalus*. Known as Syrian Tragacanth.

Used only for its property of swelling out when moistened with water, and forming a mucilage. It is sparingly *soluble* in water.

It enters into Pulv. Opii Co., Confect. Sulphuris, Mist. Cretæ, Mist. Guaiaci, and

Glycerinum Tragacanthæ, 1 in $5\frac{1}{2}$ by weight.

A homogeneous, translucent jelly, prepared by mixing $\frac{1}{2}$ oz. tragacanth, in powder, with $1\frac{1}{2}$ ozs. glycerin and $\frac{1}{2}$ oz. water.

A good Pill Excipient.

Mucilago Tragacanthæ, 60 grs. in 10 ozs.

A thick opaque liquid, prepared by mixing powdered tragacanth 60 grs. with alcohol (90 per cent.) 2 drs., and pouring in distilled water to make 10 ozs.

Enters into Lotio Hyd. Nig.

Pulvis Tragacanthæ Compositus, 1 in 6.

A white powder, composed of tragacanth, gum acacia, and starch, of each 1 oz., and sugar 3 ozs.

Dose—As a Demulcent, 20 to 60 grs.

TRINITRINI TABELLÆ (Trinitrin Tablets).

(Synonym—Tablets of Nitroglycerin.) Tablets of chocolate each weighing 5 grs., and containing $\frac{1}{100}$ gr. trinitroglycerin of commerce.

Dose—1 or 2 tablets. Vaso-dilator like Amyl Nitrite, but acting more slowly.

Liquor Trinitrini, 1 per cent. by weight, or 1 gr. in 110 mins.

(Synonym—Solution of Nitroglycerin.)

A colourless liquid, containing trinitroglycerin of commerce in alcohol (90 per cent.). Dose— $\frac{1}{2}$ to 2 mins.

TROCHISCUS BASES. (See p. 170.)**UVÆ URSI FOLIA** (Bearberry Leaves)—Ericaceæ.

The small, dried, yellowish-green, shining leathery leaves of *Arctostaphylos Uva-ursi*.

Active principles—Arbutin and Methyl-Arbutin.

Astringent, Diuretic, and Sedative to the bladder.

Infusum Uvæ Ursi, 1 in 20 ($\frac{1}{4}$ hour).

Prepared by infusing bruised bearberry leaves 1 oz. in boiling distilled water 1 pint.

Dose— $\frac{1}{2}$ to 1 oz.

VALERIANÆ RHIZOMA (Valerian Rhizome)—Valerianaceæ.

(Synonym—Valerian Root.)

The dried, yellowish-brown rhizome, with numerous bushy bundles of fibrous roots springing from it, of *Valeriana officinalis*, with a most unpleasant penetrating odour and disagreeable camphoraceous taste. Collected in autumn.

Active ingredients—A Volatile Oil and Valerianic Acid.

Antispasmodic.

☞ Valerian, Serpentry, Arnica, and Senega are often confounded, and the student should remember a few of the distinguishing points. Thus Senega, which is very like Serpentry and Valerian, is recognised by its keel or ridge, which is not marked on the smaller rootlets, but which may be seen, like a little mesentery, at the bendings of the roots on their concave side, which are of a pure *white* colour internally. The rootlets of Serpentry are smaller than those of Valerian, and are destitute of the strong, unpleasant odour of that drug. Arnica is distinguished by its dark brown colour, aromatic odour, and peppery taste.

Tinctura Valerianæ Ammoniata, 1 in 5.

A very dark, reddish-brown liquid, prepared by macerating valerian rhizome in No. 40 powder 4 ozs. in a mixture of oil of nutmeg 30 mins., oil of lemon 20 mins., 2 ozs. solution of ammonia, and 18 ozs. alcohol (60 per cent.).

Diffusible Stimulant. Dose— $\frac{1}{2}$ to 1 dr., freely diluted.

VERATRINA (Veratrine).

An alkaloid or mixture of alkaloids, in pale grey, amorphous masses, or in powder, obtained from *Cevadilla*, the dried, ripe seeds of *Schœnocaulon officinale* (Melanthaceæ), by adding a concentrated tincture of the seeds to water (which throws down albumin and resinous matters). The watery liquid, after filtration, throws down the alkaloid on the addition of ammonia. This is purified by solution in acidulated water and further precipitation by ammonia.

Should not be given internally.

Unguentum Veratrinæ, 1 in 50.

A nearly white ointment, prepared by warming veratrine 10 grs. with oleic acid 40 grs., and adding benzoated lard 450 grs.

Local Anæsthetic. Used in neuralgia like Aconitine.

VINUM XERICUM (Sherry), 16 per cent. of alcohol.

A pale yellowish-brown Spanish wine, containing about 16 per cent. of ethyl hydroxide; enters into all the wines but *Aurantii*, *Quininæ*, and *Ferri Citratis*—viz., into *Antimoniale*, *Colchici*, *Ferri*, and *Ipecacuanhæ*.

ZINCI ACETAS, $\text{Zn}(\text{C}_2\text{H}_3\text{O}_2)_2 \cdot 3\text{H}_2\text{O}$.

In thin, translucent, colourless, crystalline plates, of a pearly lustre, soluble in $2\frac{1}{2}$ times their weight of water ; prepared by neutralising acetic acid with zinc carbonate.

Dose—1 to 2 grs. as a Tonic ; 15 to 20 grs. as an Emetic. Chiefly used as an injection in gonorrhœa (2 grs. to 1 oz.).

Zinci Carbonas, $\text{ZnCO}_3(\text{ZnH}_2\text{O}_2)_2 \cdot \text{H}_2\text{O}$.

Zinc hydroxycarbonate is a white insoluble, tasteless, impalpable powder, prepared by interaction of zinc sulphate and sodium carbonate.

Mildly Astringent.

Employed in making the Oxide, Valerianate and Acetate of Zinc.

Zinci Chloridum, ZnCl_2 .

In opaque, white, deliquescent rods or tablets ; soluble almost entirely in less than half their weight of water ; prepared by interaction of zinc and hydrochloric acid.

Only used externally as a powerful Caustic, mixed with 1, 2, or 3 parts of flour or powdered starch, and in weak solution as an Astringent.

Liquor Zinci Chloridi, 366 grs. in 1 oz.

A heavy, colourless liquid, prepared by boiling 1 lb. of granulated zinc in 44 ozs. hydrochloric acid and 20 ozs. distilled water, and filtering. If iron or lead be present, add chlorine solution and carbonate of zinc to precipitate the iron or lead impurities attacked by the chlorine, and evaporate the filtered liquid to the bulk of 40 ozs. If no iron or lead be present, the chlorine and carbonate of zinc need not be employed.

Antiseptic. Known as "Burnett's Fluid" (which is only half its strength).

Zinci Oxidum, ZnO .

A soft, nearly white, insoluble, tasteless, impalpable powder, prepared from the carbonate by exposing it to a dull red heat ; or from metallic zinc by combustion ; when prepared by this latter method it is snowy white.

A Tonic in spasmodic nervous disorders. Externally—A mild Astringent, and Absorbent in weeping skin affections.

Dose—3 to 10 grs., in pill ; often combined with belladonna in night sweating.

Used to prepare the sulphocarbolate.

Unguentum Zinci, 1 in 6 $\frac{2}{3}$.

A white ointment, prepared by adding oxide of zinc 3 ozs. to melted benzoated lard 17 ozs., and stirring till cold.

Unguentum Zinci Oleatis, 1 in 2.

A white ointment, prepared by dissolving zinc sulphate 2 ozs. in water 4 ozs., and hard soap 4 ozs. in water 40 ozs.; mixing, collecting, washing, and drying the precipitated oleate of zinc, and mixing with an equal weight of white soft paraffin.

Action similar to Ungt. Zinci.

Zinci Sulphas, $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$.

In small, colourless, prismatic crystals, obtained by interaction of diluted sulphuric acid and zinc, soluble in less than their own weight of water.

☞ Often known as White Vitriol, and distinguished from Epsom salt (which it *closely* resembles) by its powerfully styptic taste.

Dose—1 to 3 grs. as a Tonic; 10 to 30 grs. as an Emetic; 3 grs. as an Emetic for a child 1 year old. As an Astringent in gonorrhœa 2 grs. to 1 oz., and in ophthalmia 1 gr. to 1 oz.

Employed in making the Carbonate and Valerianate, and Ungt. Zinci Oleatis.

Zinci Sulphocarbolas, $\text{Zn}(\text{OH}, \text{C}_6\text{H}_4, \text{SO}_3)_2\text{H}_2\text{O}$.

Zinc sulphocarbolate or phenol-para-sulphonate, in colourless tabular crystals, obtained by heating a mixture of phenol and sulphuric acid, and saturating the product with zinc oxide.

Antiseptic.

Zinci Valerianas, $\text{Zn}(\text{C}_5\text{H}_9\text{O}_2)_2$.

Zinc valerianate or iso-valerianate, in minute, brilliant, white, pearly, tabular crystals, with the odour of valerian, sparingly soluble in water; prepared by saturating iso-valerianic acid with zinc carbonate, or by the interaction of zinc sulphate and sodium iso-valerianate.

Antispasmodic and Nervine Tonic. Dose—1 to 3 grs.

ZINGIBER (Ginger)—Zingiberaceæ.

The scraped and dried rhizome of *Zingiber officinale*, in irregular, lobed, yellowish-white, chalky, but tough, pieces.

Active principles—A Volatile Oil, and Gingerin or Gingerol.

Carminative and Antispasmodic. Dose—10 to 20 grs.

Syrupus Zingiberis, 1 in 40.

A straw-coloured, muddy syrup, prepared by adding 1 oz. of a strong tincture of ginger, obtained by percolating $\frac{1}{2}$ oz. ginger in fine powder with 1 oz. alcohol (90 per cent.), and adding it to syrup sufficient to produce 20 ozs.

Dose— $\frac{1}{2}$ to 1 dr.

Tinctura Zingiberis, 1 in 10.

A sherry-coloured liquid, prepared by percolating ginger in powder 2 ozs. with alcohol (90 per cent.), to make 1 pint.

Dose— $\frac{1}{2}$ to 1 dr., diluted.

In addition to the above, Ginger and its compounds enter into 14 Pharmacopœial preparations, viz. :—

Infusion of Senna.	Compound Powder of Opium.
Compound Mixture of Senna.	" " Rhubarb.
" Pill of Squill.	" " Scammony.
" " Gamboge.	" " Aromatic Sulphuric Acid.
" " Scammony.	" " Pill of Aloes and Iron.
" Powder of Cinnamon.	" " Acid Infusion of Cinchona.
" " of Jalap.	" " Concentrated Solution of Senna.

PART IV.

THERAPEUTICS.

Acacia Gummi is the type of a pure demulcent, acting mechanically as a simple protective to the mucous surface with which it comes into contact. When swallowed, a small quantity is absorbed after being converted into sugar, the greater portion passing out unaltered in the fæces. It is chiefly used on account of its physical qualities for making emulsions and suspending insoluble powders in mixtures (see p. 13). It contains a diastatic ferment, and its solutions are prone to undergo changes which lead to the formation of irritating compounds, and in medicine only the freshly-prepared mucilage should be used.

It is administered in inflamed conditions of the *throat, gullet, and stomach*; as a basis for cough mixtures; and as a demulcent in the after-treatment of cases of irritant poisoning. It acts *mechanically* by covering over the affected surface and preventing the contact of foreign matter or irritating secretions, and in *intestinal catarrh* it may give relief when more soluble agents fail.

In mild cases of *chronic bronchitis*, or where there is hypersecretion of the mucus from the larynx, trachea, and larger bronchi, oftentimes associated with winter cough, it may be found of service, by its soothing or demulcent action upon the irritated endings of the nerves of the fauces and pharynx which, by reflex action, intensify the tracheal or bronchial cough.

Acetanilide or Antifebrin is an analgesic and antipyretic. It is also a powerful germ destroyer, but its antiseptic action is seldom turned to account in medicine, save as a dusting powder to ulcers, or wounds of the perineum occurring during labour.

Its action on the blood is important; it is supposed to be altered into acetic acid and aniline, which latter becomes oxidised into paramidophenol and may appear in the urine. In large amounts it alters the composition of the blood and changes its colour, the red cells are destroyed, methæmoglobin

is formed, and the urine is coloured by it, while the amount of nitrogen is greatly increased. Small doses raise the blood pressure, but large ones lower it and cause serious depression or paralysis of the heart.

On the body temperature in health medicinal doses produce no effect, whilst in febrile conditions the temperature is reduced with certainty and rapidity after one to two hours, accompanied generally with perspiration, but the effects are transient, and sometimes followed by depression. It seems certain that the fall is caused by diminished heat production from the action of the drug upon the thermic centres, and though the sweating aids the dissipation of heat it takes place when the skin is dry under the administration of belladonna. Though its action in *typhus*, *typhoid*, and all *fevers*, in *pneumonia*, *acute rheumatism*, *phthisis*, and nearly every feverish state is most marked, it is most undesirable to employ the drug as a routine antipyretic in these diseases, as its effects so rapidly pass off without producing permanent good, and in very high fever (hyperpyrexia) it is not to be relied upon. In the short fever of *influenza*, *catarrh*, and *sore throat*, it may be employed with benefit in doses of 2 grs. repeated every 3 or 4 hours.

On the nervous system its action is not confined to the sensory centres in the brain, since it depresses the sensory columns of the cord and the sensory nerves, and finally influences the motor apparatus, though it has no action on muscle.

As an analgesic the drug is of great value, and its power of relieving the pain of *migraine*, *neuralgia*, and other allied conditions is remarkable. It is liable to produce, even in the above-mentioned doses, symptoms of an alarming character of which cyanosis, rigors, gasping respiration, and formidable collapse are prominent, but these generally pass off soon after the administration of hot drinks and stimulants. Several deaths have been attributed to its use, though recovery once followed a dose of 450 grs.

The drug is less soluble than antipyrine, and may be used in tabloids, powders, or cachets in all conditions in which antipyrine is indicated. It is not so safe as phenacetin or antipyrine, and often skin eruptions follow its use. Untoward effects are lessened by combining it with caffeine. The following is a good combination: antifebrin 7, caffeine 1, and soda bicarb. 2: (B.P.C.)

Acidum Aceticum is a refrigerant when administered in a very dilute form. It does not appreciably reduce temperature, but in fever it produces a grateful feeling of coolness, allaying thirst, by increasing the secretion of the salivary and mucous glands in the mouth and throat.

It is mildly astringent and diuretic. Notwithstanding its power of drying up the bronchial mucus, as stated by Rossbach,

vinegar in small doses is a very popular remedy for loosening cough and increasing expectoration. Externally, acetic and glacial acetic acids are caustics, and will produce redness, vesication, and sloughing, in proportion to the strength of the acid and the duration of its application. Both the acids dissolve epithelium, and are used to destroy *warty growths*; and they have been recommended as local remedies in *cancer*, with the intention of *dissolving* the cancer cells. A weak solution of acetic acid or vinegar sponged over the body in fevers is of use in lowering the temperature, probably by reflex action. When applied undiluted to *ringworm* it kills the parasite. Vinegar has some local astringent properties, and is used as a hæmodynamic in *post-partum hæmorrhage*.

The vapour of the strong acid applied to the nostrils is used as a restorative in *cardiac depression*; it acts by reflexly stimulating the vaso-motor centre and raising the blood pressure throughout the body.

The prolonged use of this acid diminishes the number of the red blood corpuscles, causing anæmia and loss of weight, and it is improperly used to correct obesity. The acids in the undiluted state are powerful poisons.

Acidum Arseniosum acts as a powerful protoplasmic poison. Metallic arsenic is practically inert, and can only become active when changed into the oxide or other soluble compound. Large doses of arsenious acid cause in half an hour a burning sensation in the throat, stomach, and abdomen, rapidly followed by violent vomiting, colicky pains, diarrhœa, cramps, excessive thirst, exhaustion, and collapse—a group of symptoms not unlike English *cholera*. Death results from paralysis of the heart, and of the respiratory centre without cerebral excitement or mental symptoms, and the victim may succumb within 12 or 24 hours, or he may live for 2 to 4 days, or even longer. After death there are found swelling and redness, with occasional patches of softening of the gastro-enteric mucous membrane, and if the patient have survived long enough, fatty degeneration of the liver, kidneys, and cardiac muscle. These effects are observed whether the arsenic be taken by the mouth, or injected into a vein, or applied to an open absorbing surface. The poison is excreted in the urine, and in the evacuations, saliva, tears, serosity of a blister, and in the sweat; it can be readily detected in the parenchymatous tissues, and in the cord. Many instances of fatal results have been reported where no gastro-enteric symptoms have been present and no signs of such noticed after death, the patient having died in a few hours after profound coma and nerve symptoms.

Symptoms of poisoning with arsenic are not uncommonly observed in those working with arsenical pigments, or in those

living in rooms whose walls are covered with paper containing arsenical pigments ; and they may be produced by the free use of the drug, as a remedy for disease. There are œdema of the eyelids, especially of the lower one, irritability of the mucous membranes of the eyeball, nose, pharynx, and trachea, short, dry cough, anorexia, vomiting, colic, diarrhœa, and prostration. Sometimes nervous symptoms, as tremors, headache, and peripheral neuritis are prominent ; keratosis, and bronzing of the skin like Addison's disease are observed, especially in those cases where the poison has been absorbed through the respiratory tract. Epidemics of arsenical paralysis produced by the drinking of impure beer were probably due to the combined action of alcohol and arsenic, though peripheral neuritis must be always regarded as one of the most constant effects of chronic arsenical poisoning. After gradually increasing doses of the drug, a certain degree of tolerance is often observed, as demonstrated by the arsenic-eaters in Styria, who have been known to swallow six times the minimum fatal dose (which is about 2 grs.). Light is thrown upon this remarkable phenomenon of tolerance to arsenic by Besredka, who discovered that an antitoxin is formed in the blood serum of animals fed on arsenic, which so stimulates phagocytosis that the drug is absorbed by the leucocytes and liver cells in which it may long remain stored up in a harmless state.

In small doses ($\frac{1}{30}$ gr.) it acts by its *local* influence on the gastric mucous membrane, as a stomachic, increasing the digestive powers and stimulating the appetite ; it is valuable in *gastric neuralgia* and in the vomiting of chronic *alcoholism*, and in *diarrhœa* coming on immediately after eating ; in these cases 1 to 2 mins. of Fowler's solution *before* food may be given with advantage. In larger doses ($\frac{1}{20}$ gr.) arsenic acts as a nerve tonic ; rapidly gaining an entrance into the blood by absorption, it does not form albuminates like other metals in the stomach ; it is carried to the nerve centres and alters their nutrition in some mysterious manner ; thus it is found to possess anti-periodic properties like quinine, hence its value in *neuralgia*, *angina*, and *ague*.

In *chronic malarial conditions* which resist quinine, arsenic is most useful, and it is well in such cases to begin with a full dose, $\frac{1}{15}$ gr. It is said to act as a *prophylactic* against malaria.

In *asthma* it has been successful, especially in the form of cigarette combined with stramonium, and internally in combination with iodides.

In *chorea* its best effects are observed, but it must be given in full doses, and it may be necessary to push it till the well-known physiological effects are observed—viz., redness of the conjunctiva, with smarting and swelling of the eyelids, especially the lower one ; signs of irritation in the membrane of the nose, throat, mouth, and stomach. The writer has given 15 mins.

of Fowler's solution to children thrice daily without producing symptoms of irritation.

Arsenic should not be used in acute cutaneous affections. It is in *chronic*, scaly, and papular skin diseases that its great benefit is proved. In *psoriasis*, *lichen*, and even in chronic *eczema* and *acne*, it cures when all other remedies fail, but its action is slow. Its best effects are thus seen in those diseases which affect the superficial layers of the skin.

It has specific action in *pemphigus*, and it has been used successfully as a subcutaneous injection in *multiple sarcoma of the skin*. Large lymphomatous malignant tumours have disappeared under its internal and subcutaneous use, and it is the best remedy in *Hodgkin's disease*.

In *malignant anæmia* and *leukæmia* arsenic often rapidly tells when iron is useless. Stockman found that the red marrow of bones becomes markedly hypertrophied after the administration of the drug. The temporary effects of the cacodyl compounds demonstrate sometimes an enormous increase in the number of red cells in the circulating fluid.

It may be used with benefit in the early stages of *phthisis* and *catarrhal pneumonia*, and some authorities administer the drug as a routine treatment in ordinary phthisis, and affirm that it reduces temperature and checks the disease. The marvellous reports of the success of cacodylic acid, and its soda salt, in the treatment of phthisis and pernicious anæmia have not stood the test of time. Doses of the latter equivalent to 100 mins. of Fowler's solution, have been given without untoward results; it is still doubtful if the new salt is more efficacious than the oxide, as the great bulk of it passes through the body unchanged. See under Acid. Cacodylic.

Externally, arsenic is a powerful caustic, causing the death of the tissue to which it is applied, chiefly by the profound inflammation which it induces. In *cancer*, *lupus*, and *epithelioma*, its use has been advocated; but it is dangerous, as enough may be absorbed to cause death, unless applied in a concentrated form and to a very limited extent of surface.

Skill and experience are necessary for the successful use of arsenic in the removal of small epithelial tumours, and it is rather to be regretted that surgeons nowadays very seldom avail themselves of this remedy; and many have not only no experience of it, but strongly discountenance every treatment but the knife. The result too often is seen—especially in the case of epithelial cancer—that the patient shrinks from the knife, and absolutely refuses all operative interference till too late.

It is the chief remedy amongst the "cancer curers" in the North of Ireland. Some of them, no doubt, knowing nothing of the power of the drug, cause great disfigurement, and even loss of life; but others with experience and skill contrive to pro-

duce marvellously good results, with no disfigurement and little suffering.

Sir Astley Cooper's ointment consists of 1 dr. arsenic, 1 dr. sulphur, and 1 oz. spermaceti ointment, applied for 24 hours.

Hebra's paste consisted of arsenious acid 5 parts, cinnabar 1 part, and simple ointment 8 parts.

Fowler's solution has been used to remove *warts* and *corns*; Abernethy's lotion consisted of 2 drs. Fowler's solution to 1 oz. water.

Allen strongly recommends the use of a paste made of equal weights arsenious acid and orthoform and water, which is applied after scraping epitheliomata.

Arsenic, unless when given for its *local* action upon the stomach, should always be taken soon after a meal, and its effects closely watched for a short time, as some few patients are very susceptible to its action, and it is a good rule to begin always with 2 mins. of Fowler's solution ($\frac{1}{30}$ gr. arsenic), which may be increased cautiously, till 10 or even 15 mins. are reached. Children bear large doses. A choreic child 5 years old may commence with 2 or 3 mins., gradually increased to 10, or even more.

The iodide is given in skin diseases in the form of pills containing $\frac{1}{30}$ to $\frac{1}{15}$ gr., and Donovan's solution is a remedy of great value in the *tertiary* forms of syphilis. Asiatic Pills contain $\frac{1}{15}$ gr. arsenious acid with $\frac{3}{4}$ gr. pip. nig. and gum acacia in each.

R. *Liquor. Arsenicalis* ℥iss.

Tinct. Ferri Perchlor. ℥ii.

Glycerini ℥iv.

Aquam Camphoræ ad ℥iv. *Misce.*

Fiat mistura. Capiat ℥j. *mensura ter in die post cibos, ex aqua.*

☞ For the treatment of poisoning by arsenic, see Index of Poisons at the end of the book.

Acid. Benzoicum possesses antiseptic properties superior to those of carbolic and salicylic acids. When taken in moderate doses (15 grs.) it remains unaltered as benzoic acid in the blood, but it unites in the kidneys with glycocoll, and is excreted as hippuric acid, rendering the urine acid. It thus acts as a diuretic, and, on reaching the bladder, it exercises an alterative and antiseptic action on its lining membrane in mild *chronic cystitis*, with high-smelling, alkaline urine depending upon obstructed flow. It is indicated also in *pyelitis*, and is sometimes found useful in intractable *urethral* affections, accompanied by smarting pain on micturition. It does not interfere with the elimination of uric acid. Since the introduction of urotropine the drug is now seldom given as a urinary disinfec-

tant. Though possessed of expectorant properties, it is inferior in this respect to the gum from which it is extracted.

Benzoic acid possesses the antipyretic properties of salicylic acid, and may be used in *acute rheumatism* in preference to that drug. It may be given in doses of 30 grs., and the soda salt may be used as a substitute for sodium salicylate.

Acid. Boricum is an antiseptic causing the destruction of low organisms without endangering in any way the vitality of the living tissues. Hence its great value in surgery as a dressing, either in the form of the official ointment, or as a lotion (5 per cent.), or as Boracic Lint, prepared by soaking lint in a hot saturated solution of the acid, and drying. According to Kurz, it checks suppuration when applied locally, by paralysing the white blood corpuscles as they emerge through the vascular walls.

Boroglyceride—an opaque cream (prepared by Barff by heating boracic acid 62 parts and glycerin 92 parts)—can be used as a lotion in the same way as boracic acid. It has a powerful effect in preserving milk and food against putrefaction.

Stockings dipped in a hot solution of the acid, and dried, check effectually *fetid perspiration* of the feet. 10 grs. to 1 oz. water make a good injection for *gonorrhœa*, *purulent ophthalmia*, and *otorrhœa*, and in this latter affection it may be loosely packed into the meatus. Packing the vagina with the dry acid and absorbent wool gives splendid results in bad *leucorrhœa*. Perez used it internally in *bladder* affections associated with decomposing urine. 10 to 15 grs. three times a day in 2 ozs. water, will often, after a few doses, cause clear, odourless urine to flow where foul and putrid secretion had existed for months. It acts as an antiseptic on its elimination at the various outlets of the body, and in *diarrhœa* and *fermentative* states of the contents of the stomach its use may be tried.

The writer tried its effects in *typhoid fever*, but found that the stomach was upset by doses sufficient to saturate the system. He often saw excellent results from small doses.

2 or 3 grs. blown into each nostril every 4 hours by an insufflator have yielded good results in *pertussis*. Made into an ointment with lanoline it speedily relieves the *eczema* of children. A saturated warm solution may be used for washing out the bladder where the internal use of the acid cannot be tolerated.

Where the kidney is extensively diseased the acid is always badly borne by the stomach. *Dermatitis* not seldom follows its administration, even in healthy subjects when small doses have been taken, and the writer has witnessed serious chronic general dermatitis caused by the use of tinned milk which contained boric acid. A recent theory has been started that the use of the drug as a food preservative leads to appendicitis.

Acid. Carbolicum is a powerful antiseptic, destroying minute forms of animal and vegetable life, rapidly arresting fermentation, and precipitating albumin. It destroys in very dilute solution the organised, and in stronger solution the unorganised, ferments, at the same time *deodorising* their foul-smelling and poisonous products. It is useful in chronic *gastric* complaints, accompanied with offensive eructations, acting like creosote; it destroys *sarcinæ*, and retards certain abnormal fermentations in the stomach, where, by its local action, it often allays sickness and vomiting, and stops diarrhœa. The sulphocarbonate of sodium acts in a similar way, and has been used in *typhoid* and other *fevers*, and with success in *ulcerative endocarditis*.

Carbolic acid inhaled, as vapour or atomised spray, acts very effectually in checking the expectoration of *chronic bronchitis*, is invaluable in *gangrene of the lung*, and is supposed to possess the power of cutting short *influenza*. Used as a gargle (1 in 150), or as a spray (1 in 100), or as a lozenge in various pharyngeal affections, it causes anæsthesia of the mucous membrane, diminishing the reflex irritability in the palatal and other muscles, thus effectually preventing distressing attempts at swallowing, and by this means cutting short the course of *acute tonsillitis*, and relieving follicular *pharyngitis*. The spray is the best *local* routine treatment in *diphtheria*.

R. *Acidi Carbolici* ʒi.
Aquæ Rosæ ʒxii. *Misce.*

Fiat solutio. Signa—"To be used as a spray for the throat every two hours."

Applied to the skin it acts as a painless caustic, causing the death of a very superficial film, and in a similar way it may be painted over exuberant granulations. The lotion (1 oz. to 1 quart) is a good dressing for fresh wounds, and effectually destroys the foul smell of *sores* and *ulcers*, exciting in them healthy action, and hastening the healing process.

Solution of carbolic acid, when applied to the skin or wounds, acts as a local anæsthetic, diminishing sensibility, and if the cork of the carbolic acid bottle be laid against the skin so as to affect a small area with the acid, the hypodermic or aspirator needle can be almost painlessly inserted; a small, painless blister follows. Its anæsthetic effect when applied to carious teeth is often marked; for this purpose it is best mixed with collodion (1 to 3). It is used successfully as an application to various *parasitic skin diseases*, and the pure acid is good for *uterine ulcerations*. A strong solution applied to an extensive raw surface may cause gangrene of a limb, or it may be absorbed, and produce the same poisonous effects as a large internal dose, viz., violent *gastro-intestinal irritation*, *syncope*,

disturbance of respiration, muscular weakness, coma, with contracted pupils, and sometimes convulsions by its action on the vaso-motor or respiratory centre, medulla, and cord ; hence, when *extensively* employed, its effects should be watched, the urine through which it is eliminated often turning almost black (carboloria). V. Bruns has shown that there is no danger if the pure acid be applied to infected wounds and wiped off with alcohol ; the danger is in working with solutions. Even when given internally one-third of the lethal dose of the pure acid will cause death if it be diluted freely.

A portion of the acid appears in the urine free ; a portion is burnt up in the body, and is eliminated as hydroquinone ; and a portion is eliminated as sulphocarbolic and glycuronic acids, in the form of double or ether sulphates. Poisonous doses at first cause a rise in the blood pressure, which soon gives place to a great fall, as paralysis of the medullary centres, respiration, and heart occurs ; the blood becomes dark and loses its coagulability.

☞ For treatment of poisoning see Index of Poisons.

Deep hypodermic injections of $\frac{1}{2}$ gr. of the acid in 20 mins. of water have been found most successful in deep-seated *inflammations, glandular and joint swellings, erysipelas, poisoned wounds*, and as a means of aborting *boils and carbuncles*, etc. $\frac{1}{2}$ gr. in 5 mins. of water injected into *piles* causes their rapid disappearance.

Sir A. Clark treated *hay-asthma* by applying the following with a brush to the pharynx through the nares—Glycerin of Carbolic Acid 1 oz., Hydrochloride of Quinine 1 dr., Corrosive Sublimate $\frac{1}{2}$ gr.

The acid is best administered in the form of a pill, but creosote in the form of capsule is preferable and more reliable ; for external application 1 in 40 of water is the strength of the " Lotion " used for all ordinary purposes. " Carbolic Oil " composed of 1 part acid and 10 parts olive oil is practically useless as a germ destroyer.

Acid. Chromicum possesses the power of killing all low organisms, oxidising organic matter, coagulating albumin and destroying the tissues with which it comes in contact. It is thus an antiseptic, disinfectant, and caustic, and is chiefly used in the concentrated form (the deliquesced crystals) to destroy *condylomata*, warty, and other superficial growths, which it does effectually. A lotion of 10 grs. to 1 oz. has a decided effect upon *syphilitic and gouty diseases of the tongue and throat*. A 3 per cent. solution brushed over the feet checks sweating of the parts, but if abrasions be present dangerous irritation may result. Death has resulted several times from the absorption of the acid when too freely applied externally.

Acid. Citricum and Succus Limonis, identical in action with tartaric acid, are grateful refrigerants, a small quantity sucked in the parched mouth producing a refreshing moisture by stimulating the salivary glands, and probably also all the glands of the mucous membrane down to the stomach. When administered in health, the urine becomes slightly more acid under their use, but in *fevers* they do not increase the acidity of the urine. The neutral salts of the vegetable acids act as refrigerants, but they differ from the acids in increasing the alkalinity of the blood, being oxidised and converted into carbonates, in which state they pass out in the urine, increasing its alkalinity or rendering it alkaline if acid. Citric and tartaric acids are largely used in medicine to make effervescing draughts, which, on being swallowed whilst the carbonic acid is being given off, act as sedatives to the mucous membrane of the stomach, the gas having a soothing influence upon the terminal filaments of the nerves of this organ. Upon p. 179 will be found a useful table of the requisite proportions of different alkalies to make an effervescing mixture, and below is the formula for one of these. Lemon juice acts like citric acid, but is found to be more efficacious in *scurvy*, acting in some way as a blood restorative, and, in addition to being a specific in this disease, it is a prophylactic. It was formerly often administered in *acute rheumatism*. A decoction of *fresh lemon* is believed to possess antiperiodic powers in *intermittent fever*, and Blanc insists upon the value of lemons and other acid fruits in *gout* with the view of "diminishing the production of uric acid, and of increasing urinary alkalinity." A solution of citric acid is largely used as a substitute for lemon juice. It has feeble antiseptic properties. Citric acid or the citrate of potash possesses the power of decalcifying the blood, robbing it of its lime salts, and diminishing its coagulability.

R. *Potassii Bicarbonatis* ʒvj.

Aquæ Laurocerasi ʒj.

Aquæ Destillatæ ʒxij.

Solve, capiat cochlearia duo ampla cum succi limonis recentis cochleare amplo in effervescentia ter in die.

Acid. Gallicum and Acid. Tannicum are vegetable astringents. Tannic acid coagulates albumin, gelatin, and mucus, but gallic does not. The way in which these substances produce their astringent effect cannot, however, be explained upon merely chemical principles. They were generally supposed to act by "tanning" or "condensing" the skin, tissues, and membranes with which they came in contact, and it was believed that when taken internally they acted directly upon the muscular tissue in the arterial coats and lessened the calibre of the small vessels. Experiments, however, prove that the vessels are dilated,

though there may be a previous short period of contraction, and that the partly chemical and partly vital action of these acids is yet to be explained. Gallic acid has no local astringent action, and should be omitted from the B.P.

Tannic acid, when administered, is changed to gallic in the stomach and intestines, and as such passes into the fæces and urine, hence gallic acid was formerly selected for internal administration. Tannic acid should always be used when a local effect is desired, and its effect in rapidly diminishing the secretion of a mucous surface to which it is applied is striking and unmistakable. *As remote astringents both tannic and gallic acids must be considered valueless*, save in the faint action they possess in common with all acids in diminishing the alkalinity of the blood and thus increasing its coagulability. Nevertheless, they are still used by many in *internal hæmorrhages*, in *excessive secretions* from different parts of the body, and for cutting short *local inflammations*, as in various forms of *sore throats*, *nasal catarrh*, and *gonorrhæa*. By their action the secretion of the *bowel* is lessened, and the contents become more solid, owing to the *local* action of the drug as it passes down the tube before absorption, and hence its value in *diarrhæa*. It has been found useless in *albuminuria* and *phthisis*. Tannin may be given in 5 to 10 gr. doses, dissolved in water, or made into a pill with a little glycerin. The gall and opium ointment is an astringent remedy for painful *hæmorrhoids*, and the glycerin of tannin for *enlarged tonsils* and relaxed conditions of the throat. Tannic acid may be applied directly to bleeding surfaces as a styptic to stop hæmorrhage.

Tannic acid is used as an antidote in *poisoning by the alkaloids* to form tannates which are only partially soluble.

There cannot be a doubt of the value of the newer compounds of tannin in *intestinal catarrhs*. (See under Tannalbin.)

Acid. Hydrobromicum has sedative properties much weaker than the bromides. (See under Bromum.) It is a good solvent for the quinine salts, and is administered with the view of preventing their unpleasant effects.

Acid. Hydrochloricum, Nitricum, and Sulphuricum.—The mineral acids, when applied externally, act as powerful corrosives and escharotics when undiluted, and when administered internally in their strength they act similarly, destroying the tissue of the digestive tract, and producing the well-known effects of corrosive poisons. In both these cases their action may be regarded as *chemical*, as they in like manner act upon dead tissues. These results are explained by their action on albumin and by their great affinity for water, which they abstract so rapidly as to cause the death of the tissue containing it. Nitric acid is the one selected when we wish to avail ourselves of this property, as its action is more circumscribed, and

it is used in *phagedænic ulceration* and *sloughing* by applying the strong acid with a stick or glass brush. It destroys all unhealthy tissue, at the same time altering the condition of the surrounding living parts so that diseased action is stopped, and a new healthy action set up. It is likewise used to destroy *warty growths* and to stimulate *sluggish ulcers*, and it is useful when applied to the interior of the *uterus* in chronically inflamed conditions. Its action is very superficial, because it cannot redissolve the albumin which it precipitates and which thus limits its penetration into the tissue. Inhalation of nitric acid has recently been advocated in *asthma* and *chronic bronchitis* by Capparelli, who adds a few drops to water, whose steam is then inhaled for 5 to 10 minutes.

Strong sulphuric acid is used as an application to *carious bone*, to the interior of *disorganised joints*, *cancer* and *chancres*, and phosphoric acid also acts as a powerful caustic. Diluted with from 200 to 300 times their bulk of water, they form good astringent lotions for *sluggish sores*, or gargles for relaxed conditions of the *throat*. Roberts recommended an injection of weak nitric acid to dissolve phosphatic stones in the bladder.

Internally, the mineral acids stimulate the alkaline secretions of the body, and, according to Ringer, check the acid ones; thus the saliva, bile, and intestinal juice are increased, and the secretion of acid gastric juice lessened. This gives us an explanation of the value of these acids in *dyspepsia*. Hydrochloric acid, which is a constituent of the gastric juice, is used in chronic *gastric* complaints, a dose administered *before* a meal checking the excessive irritating acid secretion and stimulating the appetite; whilst *after* a meal, in a different class of cases, the digestion is accelerated by supplying the deficiency of acid, as pepsin refuses to dissolve proteids unless free acid is present. The value of hydrochloric acid in the treatment of chronic gastric affections in which it is often prescribed in a routine manner is very doubtful. Where the test breakfast shows a deficiency or absence of free acid, as in *achlorhydria* and in *achylia gastrica*, unmistakable benefit may be expected, especially if the acid be prescribed in combination with pepsin, as in the prescription following, and this is often beneficial, even in the early stages of gastric *cancer*, but in gastric *ulcer* it is nearly always harmful. In the dilute solution existing in a full stomach the vaunted *antiseptic* properties of the acid are useless. The acid under normal conditions in the stomach is in combination with the pepsin as it is excreted.

R. *Acid. Hydrochlor. Dil.* ℥iv.

Tinct. Nucis Vom. ℥iss.

Glycerini Pepsini ad ℥iv. *Misce.*

Fiat mistura, cujus capiat cochleare minimum ter in die ex aqua cum cibum.

The mineral acids are rapidly absorbed, having great diffusive power, and on entering the blood they combine with bases, freeing weaker acids from their salts, and thus rendering the blood less alkaline ; this effect is very evident in the herbivora. Whilst passing through the liver they probably influence the tissue changes which take place between the blood and the hepatic cells, as their administration diminishes the amount of urea secreted. They are thus cholagogues. They appear in the urine as salts of urea. The dilute or aromatic sulphuric acid, in 20 min. doses, freely diluted, is said to check *hæmorrhages* and *sweating*, and has proved surprisingly efficacious in *senile pruritus*.

As regards the astringency of the mineral acids, sulphuric is the strongest and hydrochloric the weakest, and their effect upon the bowel is probably *local*.

In *chronic diarrhœa* excellent results are sometimes obtainable by full doses of hydrochloric acid given immediately before food.

The free administration of the diluted mineral acids renders the urine slightly more acid than the normal condition, and hence their indication in the *oxalic* and *phosphatic diatheses*, but they do not cause the already alkaline urine to become acid.

In *fevers*, the administration of the diluted mineral acids (the Swedish treatment) is followed by good results. They make up for the deficiency of acid in the gastric juice, which is a feature in fever ; they increase the saliva and remove the parched condition of the throat and tongue ; they help to neutralise the excessive alkalinity of the blood, and hence tend to retard the general wasting or metabolic processes in the system, and they may assist to some extent in correcting the acrid alkaline motions of *typhoid fever*.

Acid. Hydrocyanic. is the most rapid poison known, killing, if administered in a concentrated form, in less than a minute, by acting as a profound nerve and cardiac sedative, and paralyzing the brain, cord, and motor nerves. After a large dose the patient falls, his respiration becomes convulsive, pupils dilated, and face congested, death ensuing by rapid asphyxia, succeeding convulsions and coma, though the blood in a quickly fatal case may be florid in the veins ; the tissues lose the power of absorbing oxygen, owing to the action of the poison on the protoplasm. If life be prolonged, the blood becomes dark.

It is used in medicine chiefly on account of its sedative action when applied to the peripheral extremities of irritated or painful nerves ; hence its use in painful *gastric* disorders, accompanied by *vomiting*, 3 min. doses in *gastric ulcer* or *cancer* often giving much relief, and, by blunting the sensibility of the nerves, it is

useful in the reflex vomiting of *pregnancy*, for the cough of *phthisis*, and externally for allaying the itch of *urticaria*, *lichen*, etc., when applied in these latter cases as a lotion of 1 in 40, care being taken that the skin is not broken. Though the drug in full medicinal doses will act as a sedative upon the respiratory centre and cardiac apparatus, nevertheless the wise physician will limit its therapeutic uses to strictly local effects, as in painful gastric affections and skin diseases.

The preparations of bismuth may be ordered with great advantage with prussic acid in stomach affections.

☞ For Poisoning, see Index of Poisons.

R. *Acidi Hydrocyanici Dil.* m. lx.

Bismuthi Carb. gr. clxxx.

Mucilaginis Recentis ʒiss.

Aquam ad ʒiv. *Misce.*

Fiat mist. cujus capiat ʒj. ter in die, ante cibos p.p.a.

Acid. Lactic. possesses properties similar to those of the mineral acids as described under Hydrochloric. The dilute acid has a solvent action when applied in *diphtheria*. The writer has used the strong syrupy acid with success in *lupus*; it only attacks the diseased tissue, and is not very painful, and it leaves a good scar. A 50 per cent. solution in *pharyngeal* tubercle has given good results.

Internally it is a valuable aid in *atonic dyspepsia*, and a grateful refrigerant which has done good service in *diabetes* and *vesical catarrh*. Sour buttermilk will be found superior in most respects to lactic acid for internal use. This the writer has often proved, especially in the vomiting of *chronic Bright's disease*, and in the *phosphatic diathesis*. Metchnikoff has advocated the administration of the various lactic-acid-forming bacilli with the view of inhibiting the growth of *Bacillus coli* and other organisms within the alimentary canal, and already a host of preparations containing the lactic acid bacilli have been introduced as specifics for *diarrhœa*, *dysentery*, *colitis*, and every disease supposed to arise from intestinal infection. They are also vaunted as agents for prolonging life beyond patriarchal limits. The writer believes that the best results are obtainable from the home-made Koumiss, whose preparation will be found described in the section of Non-Official Remedies. This formula appeared in the first edition of his "Dictionary of Treatment" in 1892, previous to which time he had been continuously using it in all *wasting diseases*, *chronic* and *acute intestinal disorders*, *Bright's disease*, etc., with the greatest advantage.

Acid. Nitric.—See Acid. Hydrochloric., under which head its chief uses are mentioned.

Acid. Nitro-Hydrochlor. Dil. is a valuable cholagogue. (See under Acid. Hydrochlor.) As a restorative in prostration and loss of appetite, following prolonged mental labour, combined with a vegetable bitter, in 15 to 20 min. doses, it will be found a most satisfactory and efficient tonic, especially if a little free hydrochloric acid be prescribed with it, as the nitric acid is believed to retard pepsin digestion. It should be *recently prepared*. Used in the form of a bath in *chronic congestion of the liver*, by mixing 1 oz. strong nitric and 2 ozs. hydrochloric acids with 2 galls. water at 98°, it will be often found useful.

Acid. Oleic. and Oleates.—The B.P. oleates are used as substitutes for mercurial and zinc ointments, whose actions they closely resemble. Oleic acid dissolves metallic oxides, forming the so-called oleates, which are held in solution in excess of the acid.

Acid. Phosphoric. acts like the mineral acids, as described under Acid. Hydrochloric. It is refrigerant and tonic, and is supposed by some to have the power of dissolving phosphatic deposits when pushed to the extent of acidifying the urine. It makes an agreeable drink in *diabetes*, but has none of the therapeutical virtue of free phosphorus. The concentrated acid is a strong caustic, and Grossich advocates the use of a 10 per cent. solution as a dressing for *ulcers* and an injection into *scrofulous glands and joints*.

Acid. Salicylic. in 2 per cent. solution speedily kills bacteria and stops fermentation. It is used as a surgical dressing either in the form of "lint," or "wadding," or "ointment" (1 to 27), or "lotion" (acid 10 parts, borax 20, water 100). Whilst the power and certainty of its action as an antiseptic, together with its mildness, combine to make it so valuable, it has the great disadvantage of being *non-volatile*. It has been used with benefit as a local antiseptic application in *diphtheria*, and a solution in collodion (1 to 2) speedily destroys *corns* and *lupus*, acting only on the *diseased* cells. In the form of Lassar's Paste, it has been extensively employed in *eczema*. The soda salt has less lethal effect upon germs; a solution has been used as a local application to the joints in *acute rheumatism*, in *pruritus* from various causes, and to check fetid perspirations of the feet and armpits.

Salicylic acid, in doses of about 15 to 20 grs. every 2 or 3 hours, soon produces effects in the healthy individual like quinine—fulness in the head, buzzing in the ears, disturbances of vision—and if the dose be very considerably increased in frequency and amount, other more alarming symptoms supervene, as deafness, squinting, sighing respiration, restless delirium, with dark albuminous urine, involuntary evacuations, and convulsions (it does not reduce the temperature in health). These symptoms may terminate fatally by its paralysing action

upon the respiration, though it probably requires an enormous dose of the pure acid or its salts to bring about such an issue. Charteris' researches proved that these symptoms were mainly owing to the presence of cresotic acid, and they are rarely witnessed now, since the acid and its soda salt are almost always met with in a pure state.

Salicylic acid is excreted by the saliva and perspiration, and appears in the urine after administration, mostly as salicyluric acid, which may give the sugar reaction to Fehling's test for several days after the drug has ceased to be administered. The green coloration sometimes noticed is owing to the presence of indican or pyrocatechin. In the blood it exists as alkaline salicylates. The amount of uric acid in the urine is greatly augmented, and Haig has pointed out the utility of salicylates in preventing the accumulation of uric acid in uric acid diseases, and thus explains their value in *migraine* and *epilepsy* and in *gout*, especially in preventing attacks of gout. It is eliminated from the blood by the synovial membranes according to Gaglio.

It is in *acute rheumatism* that this drug and its soda salt give best results; the temperature is reduced generally within 24 hours. Often pain and temperature are most markedly diminished in 12 hours.

20 grs. of salicylic acid, or salicylate of sodium, in $\frac{1}{2}$ oz. of any infusion or in water every 2 hours for 3, 4, or 6 doses, as the severity of the pain and height of the fever heat indicate, will be found the best practice to adopt. Profuse sweating will generally follow after each dose. The maximum daily dose should not exceed 2 drs. Alcoholic patients usually tolerate the drug badly.

Often patients express relief after the first or second dose, and it is not unusual to have a fall of 3 to 5 degrees at the end of 24 or 48 hours, or a total cessation of *all* the symptoms of the disease. The writer has seen equally satisfactory results follow $\frac{1}{2}$ oz. doses in the horse. The drug acts upon the thermic centres, and the fall in the fever heat is not merely the result of the sweating, but is owing to diminished metabolism and to its power in destroying the material poison which produces the fever.

It is affirmed that the chances of *heart* complications are lessened, and that the course of the disease is cut short by this treatment. Pain and fever return if it be withheld, but will yield again on its administration, and the drug must be given in diminished doses for at least ten days after the fever has disappeared. Latham holds that it is decidedly curative, but he insists upon the use of the pure acid obtained from the winter-green, and points to the absence of the physiological effects of the drug as long as the rheumatic poison circulates in the blood, even when large doses are being administered.

In the *hyperpyrexia* of acute rheumatism it is not safe to trust to the antipyretic virtues of either salicylic acid or quinine; the cold bath should be employed. MacLagan found the cerebral symptoms produced by large doses of salicylic acid to disappear on the substitution of salicin for the acid.

For the high temperature in other diseases (typhoid fever, scarlatina, pneumonia, etc.), this remedy has been found useful, but in no other affection save rheumatism does it supersede quinine.

It is a cholagogue, and increases the amount and fluidity of the bile, and may be given in cases of *gall-stone*.

It is recommended in small doses to relieve *headache*, and in larger doses in *phlegmasia dolens*, *neuralgia*, and *lumbago*. Ringer finds it the best remedy for *sciatica*. It has emmenagogue properties, and it may excite abortion.

Acid. Sulphuric.—For the astringent, tonic, and caustic properties of this remedy, see under Acid. Hydrochloricum. It should be remembered that it is valuable as an astringent only in bleeding from *mucous* surfaces with which it comes into direct contact. It is also used as a prophylactic and curative agent in *lead poisoning*.

Acid. Sulphurosum destroys the lower forms of life, both animal and vegetable. Hence it is useful in *parasitic skin diseases*, applied diluted with an equal bulk of glycerin; and internally in *pyrosis* and *fermentative conditions of the stomach*, depending upon the existence of dilatation or of *sarcinæ*. It has been occasionally vaunted as a remedy in *zymotic diseases*, and in *cholera*, and as a fumigation. It should be given in doses of $\frac{1}{2}$ to 1 dr. freely diluted. It has been used as a spray in *laryngeal phthisis*.

Acid. Tannicum is fully discussed under Acid. Gallicum.

Acid. Tartaricum is identical in therapeutic action with Acid. Citric. (which see).

Aconite and its alkaloids, applied locally to the mucous membrane of the nose and eyes and lips, at first cause local irritation, followed by anæsthesia. It produces paralysis of the sensory terminals, and causes death by paralysing the respiratory centre or depressing the heart without affecting the cerebral faculties. Before this event takes place various alterations in the sensory and motor apparatus occur. A feeling of tingling occurs throughout the body, beginning in the most sensitive parts, as the tongue, throat, and finger-tips, and extending gradually to the least sensitive, and the terminations of the motor as well as sensory nerves appear to be irritated and then paralysed. There is great depression of the entire nervous system, with diminished sensibility and loss of power of all the nerves of the spine and medulla. The pupils oscillate

between contraction and dilatation, finally remaining widely dilated. The temperature and blood pressure fall, vomiting and convulsions generally appearing before death, which results from cessation of respiration. The muscles do not lose their excitability. The drug acts, according to Ringer and Murrell, as a profound protoplasmic poison, with a selective action upon the nerve protoplasm.

It is chiefly on account of its distinct sedative action on the heart that aconite is useful, moderate doses, as pointed out by Ringer, reducing the pulse to 40 beats in the minute, and lowering the respiration. The slowing of the heart, following medicinal doses, is mainly caused by the stimulation of the vagus centre by the drug. Following the reduction of the pulse and arterial tension in febrile conditions, the heat of the body falls steadily, and the skin keeps moist, and the urine is increased, aconite acting as a diaphoretic and diuretic, though the sweating does not account for the reduction of temperature.

These effects produced by aconite have led to its administration in the treatment of inflammations—as *pneumonia*, *peritonitis*, *pleuritis*, *rheumatism*, and *erysipelas*. It seems to be especially useful in *acute throat affections*. It should be given in small doses—2 mins. of the tincture every 15 minutes for six or eight doses, then every 2 or 3 hours, and kept up while the thermometer registers above 100° F. Aconite is found very useful in *neuralgia* of the fifth nerve, and it increases the efficacy of quinine in most neuralgic conditions. Success has followed its administration in the vomiting of *pregnancy*. Externally it paralyses the sensory nerves, causing tingling when applied to the skin or tongue, and thus it often relieves *pain*, especially when rubbed in, in the form of unguentum aconitinæ, over the course of the affected nerve, or used as a liniment in *rheumatism*, *sciatica*, *lumbago*, etc. The A. B. C. Liniment consists of equal parts of the liniments of aconite, belladonna, and chloroform.

Cash and Dunstan have demonstrated the partial antagonism between aconitine and the other alkaloids contained in the root, and they advise that the pure aconitine should take the place of the indefinite mixture of physiologically antagonistic alkaloids contained in the B.P. preparations. *Aconitum Ferox* is preferable to *Aconitum Napellus* in several respects.

Adeps, Adeps Benzoatus, and Adeps Lanæ are used solely as external emollient applications, affording a uniformly soft and unirritating base for the preparation of ointments containing more active substances. The benzoin is added to resist the putrefactive changes to which lard is so liable. Lanoline is readily absorbed by the skin, but it is doubtful if it so very materially assists the absorption of alkaloids and other drugs

as was at one time believed, except in the case of mercurial salts. It forms an excellent basis for ointments, and possesses the property of absorbing water to a surprising extent; it is stable, bland, unirritating, and antiseptic. Its stickiness is overcome by mixing a little lard or vaseline with it.

Æther is used in medicine with three different intentions—
 1. As a *local anæsthetic*, thrown in the form of a spray upon the skin or gum, when the reduction of temperature caused by its rapid evaporation becomes so great as to freeze the part, depriving it of all sensibility, relieving superficial neuralgia, and permitting the performance of minor cutting operations or the extraction of teeth, and easing the lightning pains of *ataxia*. The ether used for this purpose is the official "*Æther Purificatus*," or Absolute Ether (Methylated), S.G. 718. 2. It is administered *internally* in moderate doses; when it reaches the stomach it stimulates its movements, increases the gastric secretion, expels flatus, and acts as a powerful diffusible stimulant and narcotic, like alcohol; it was consumed largely in some parts of Ireland as a substitute for whisky. It is antispasmodic, and is useful in *bronchitic asthma*, in doses of $\frac{1}{2}$ to 1 dr. In emergencies, as in syncope, *hæmorrhage*, *angina*, *internal gout*, etc., and in *uræmic dyspnœa*, where a rapid stimulant is demanded, it may be injected hypodermically. Durande's remedy for the solution of gall-stones was a mixture of turpentine and ether. 3. It is *inhaled* to produce general anæsthesia, affecting first the cerebrum, then the sensory, and next the motor centres of the cord, next the sensory, and finally the motor centres in the medulla.

Ether is about four times safer than chloroform, having a stimulating action on the heart and vaso-motor centre; when death occurs, which is rare, it is owing to the paralysis of the respiratory apparatus. It is, on the other hand, more disagreeable and more tedious, and sometimes produces bronchial irritation, and is more liable to be followed by vomiting.

Pure anhydrous washed ether S.G. 720 is best for inhalation. The usual method is (1) to commence with Clover's Inhaler, by means of which the mixture of air with the ether vapour is strictly limited, anæsthesia being produced in about three minutes, after which air may be more or less freely permitted, according to requirements, as the administration is maintained by the same form of inhaler, or by the substitution of Ormsby's apparatus or any form of "open" inhaler. (2) It can be administered in conjunction with nitrous oxide or ethyl chloride, which may be used to produce insensibility, which can afterwards be kept up for a considerable time with ether. Or (3) the initial anæsthesia may be produced by A.C.E. mixture, using a Skinner's, which is afterwards to be replaced by a Rendle's, mask. (4) A.C.E. Mixture (alcohol 1, chloroform 2, ether 3) or Vienna Mixture (chloroform 1, ether 3) may be employed

throughout. The temperature of the body falls considerably in prolonged etherisation. The danger of the vapour catching fire must never be forgotten.

Vedd injects 5 to 10 mins. of pure ether into *wens* frequently, and in a fortnight finds their contents liquid; he then makes an incision, after which they shrivel up; and Meierhof successfully uses ether to remove *plugs of cerumen* in the auditory meatus.

Æther Acetic resembles ether in action, only it is more agreeable and milder, and acts as a mild antispasmodic and diaphoretic in doses of half a teaspoonful in sweetened water or sherry. Hoffman's Anodyne possesses similar qualities.

Æther Nitrous—as found in the Spirit. Æther. Nitrosi—is a very efficient and agreeable diaphoretic or diuretic, especially useful in *dropsies* in the debilitated. It possesses powerful narcotic properties like ether, when given in large doses.

As first pointed out by Leech, it is a reliable vaso-dilator, acting like the other nitrites, but it rapidly loses this property when mixed with water in mixtures unless an alkali or acetate of ammonia be present.

It is invaluable in all *febrile affections of childhood* characterised by a hot skin; and in full doses, 12 or 15 mins. for a child 1 year old, it soothes the irritation of *delayed dentition* better than any other safe remedy. For a child 1 year old:—

R. *Spirit. Æther. Nit.* ʒiiss.
Aquæ Ammon. Acet. ʒiv.
Syr. Aurantii Fl. ʒiv.
Aquam Anethi ad ʒii. *Misce.*

Ft. mistura. Capiat ʒj. secundis horis.

Alcohol Absolutum is ethyl hydroxide with not more than 1 per cent. of water. Though the various alcoholic liquids are introduced into the B.P. for pharmaceutical operations chiefly, and not for their therapeutical properties, still the student must have a clear knowledge of the action of alcohol.

The popular term of "Stimulants," as applied to the various preparations containing alcohol, is very apt to mislead. In full doses alcohol should be regarded as a true narcotic, like chloroform, ether, or, in some respects, opium. Narcotics at first cause a period of stimulation or excitement, afterwards followed by sleep and coma; and alcohol differs from the substances just mentioned only in degree, its period of excitement being longer. Shmiedeberg, however, maintains that there is no initial stimulating stage, but that the apparent excitement is caused by a paralytic action upon the inhibitory functions. In his opinion there is a depressant action from the first upon all parts of the nervous system.

Small doses increase the flow of saliva and gastric juice, improving the appetite and digestion, augment the force of the heart, dilate the capillaries of the skin, and increase the mental activity—probably by dilating the cerebral vessels. Large doses tend to retard the digestive process, and, if long continued, induce chronic gastric catarrh and hepatic congestion, ending in cirrhosis. Poisonous doses at first stimulate and then paralyse the nerve centres in the inverse order of their development, beginning with the higher mental or emotional centres, and proceeding in order to the lowest, soon destroying reflex action, producing profound coma, dilated pupils, pallor of the skin, feeble pulse, a reduced temperature, embarrassed respiration, and, finally, death from paralysis of the respiratory or cardiac centres.

Poisonous doses reduce the temperature from 5 to 10 or more degrees F., and often small doses cause it to fall half a degree; this effect of small doses is not constant, and is not met with in those having become accustomed to its prolonged or intemperate use. Brunton has clearly shown that the early symptoms are owing to the action of the alcohol upon the vascular system by causing dilatation of the superficial vessels, and allowing the great sheet of cutaneous capillaries to cool the blood by transmission and radiation. When the surrounding air is *very cold*, these vessels, which ordinarily contract and prevent reduction of temperature, dilate to such an extent under alcohol as to cause the patient's death speedily by loss of heat in the arctic climate. When given in small doses it seems certain that nearly the whole of the drug is used up in the system, acting as a food like sugar, producing vital energy and heat. Binz states that alcohol, with the exception of a minute fraction, is completely oxidised in the organism, acting as a fuel; the principal result being a great saving of albumin. It certainly saves carbohydrate and fatty metabolism, thus diminishing proteid waste; but owing to its degenerative action on the liver and renal cells and on the cardiac muscle, it is equally certain that it is a most objectionable form of food.

Alcohol is given very freely by many in *fevers* and in *acute diseases*, some believing in its value as a true stimulant to the vascular and nervous systems; others maintain that by lessening oxidation it retards metabolism and saves tissue waste, others believing only in its value as an easily assimilated food and in its powers of reducing temperature. Elaborate directions are given for its exhibition in such cases, some authorities relying upon signs of failure in the heart and general circulation, others looking for indications from the exhausted nervous system. (See the Author's "Dictionary of Treatment," for the rules of its exhibition in fevers.) Most authorities would probably agree (1) that alcohol is not necessary at all in the *majority* of cases; (2) that often unpromising cases pull through without

it ; (3) that in severe cases it cannot be safely withheld from those habituated to it ; (4) that occasionally, by the use of alcohol, life may be saved which would otherwise be lost ; and (5) that it is rarely needed in the very large doses prescribed by some ; 8 to 10 ozs. whisky may be regarded as representing a liberal daily allowance.

When given to combat the symptoms of *shock* and *collapse* it should be only slightly diluted, as some of its effect is owing to its irritating action upon the mucous membrane.

One large dose of alcohol at bed-time is a good narcotic in very many diseases, if the patient has been a stranger to the drug. In sleeplessness from overwork, neuralgia, etc., its value is apparent ; and, moreover, the danger of the patient becoming the victim of intemperance (a danger never to be lost sight of) is reduced to a minimum when given in one large dose, like a draught of laudanum or chloral, after his retiring to bed. It should be given made into punch ; and whisky is the best form of alcohol for this purpose (3iiss). In many inflammatory diseases the addition of 30 grs. of nitre is an improvement. The effects are not always in proportion to the percentage of alcohol contained in wines and spirits, since the subtle ænanthic ethers which develop as the liquids become aged, produce characteristic effects, and the impurities often present play an important part.

Brandy, Whisky, Gin, and Rum contain about 45 per cent. of alcohol ; Port Wine, 16 to 17 ; Sherry, 15 to 16 ; Madeira, 14 to 15 ; Claret, 5 to 7 ; Porter (bottled) and Ale (bottled), 5 to 6.

Alcohol must be administered with great caution where the kidneys are diseased, and in all cases of chronic functional nervous disease, as in hysteria, its use should be prohibited.

Externally, spirit is used as a dressing possessing antiseptic properties. The ordinary " spirit lotion " is made by adding 1 part of the official Spt. Rect. to 3 of water, or equal parts of whisky and water, and so constituted may be used as an evaporating lotion, when applied to any part on lint, and the vapour permitted to escape freely. It thus cools the part, and by directly abstracting heat it modifies inflammatory action and causes condensation of the tissues. When spirit lotion is applied on lint, and covered in with oiled silk, so that its vapour cannot escape, then it acts like a mild, stimulating *antiseptic* poultice, and causes dilatation of the superficial vessels. Strong solutions harden the skin and tissues, and are useful in preventing *bed-sores*.

Aloe Barbadensis and **Aloe Socotrina** contain the same anthracene principles found in rhubarb, senna, and cascara, and consequently act as cathartics, chiefly acting on the large intestine, especially on its lower half, producing—in doses of 2 to 4 grs., after about 12 hours—copious softened evacuations,

generally accompanied by some griping. Aloes produces its effects when sprinkled over a blistered surface, or injected into the blood, probably by being eliminated by the mucous membrane of the colon, which it stimulates to increased action. It has a decided stimulating effect upon the liver, and increases the quantity of bile, at the same time acting upon the duodenum, but it only acts as a purgative *when bile is present* in the duodenum or intestines. Very large doses cause watery motions by increasing the intestinal secretion. Very small doses, as $\frac{1}{8}$ to $\frac{1}{4}$ gr., increase the appetite and give tone to the stomach, acting like other vegetable bitters.

The effect of this drug depends more upon the state of the bowels than upon its dose. 2 or 3 grs. will be found enough for ordinary results, and, if followed in about 10 hours by a mild saline, will prove a very effective cathartic.

It is in *chronic constipation* that aloes is most used, and 1 gr. in a dinner pill, or $\frac{1}{2}$ gr. with nux vomica, will give good results. Spender's pill consists of 1 gr. watery extract with 2 grs. sulphate of iron. When administered in this manner the use of aloes is not followed by constipation, nor is there much necessity for the dose being gradually increased as with other cathartics; upon the other hand, with care it may be gradually lessened. It is of value in *amenorrhœa*, being supposed to excite the uterus from its proximity to the rectum, but for this purpose it should be ordered with iron about the expected time of the delayed menstrual appearance. In small doses it relieves, but often large doses aggravate *hæmorrhoids*, and should not be given in pregnancy or inflammatory conditions of the rectum or pelvic organs. The extract of aloes is the best form for administration, and it is of it that the above doses are given; its effects are increased by the addition of a bitter.

Aloin should be given in about half the above doses. Sir Andrew Clark's pill for *chronic constipation*, administered before the last meal of the day, consists of $\frac{1}{2}$ gr. each Aloin, Ext. Nux Vomica, Sulphate of Iron, Myrrh, and Soap. Aloin may be combined with extract of cascara advantageously. It is probably inert until changed in the bowel by the intestinal secretion to an amorphous substance.

The Compound Decoction of Aloes gives good results in many intestinal complaints, and the writer has found surprising effects from it in obstinate *diarrhœa* in children and adults; cases having been observed to resist all treatment, both astringent and eliminatory, have yielded to a few 1 to 2 oz. doses, which seem to possess some alterative action on the mucous membrane, often causing in 6 hours a soft solid motion where watery evacuations have been the rule for many days. It is, however, a most unreliable purgative—1 oz. occasionally purging at one time and constipating the next. The powder known

as *Hiera Picra*, containing aloes and white canella bark, is a popular emmenagogue.

Alum is an astringent, causing coagulation of albumin and condensation of tissue and diminution of the calibre of the vessels. Externally it is powerfully styptic, and the *dried powder* is an escharotic, destroying *granulations* and *warty growths*. It is now generally believed that the astringent action of alum is a purely local one, and that it has little effect in distant hæmorrhages, but it will check gastric bleeding and the hæmorrhage of typhoid fever. In large repeated doses (of 1 dr.) it is emetic, and combined with opium, it *purges* gently in *painter's colic*, and is a remedy of great value in the treatment of *lead poisoning*.

4 to 8 grs. in 1 oz. water cure purulent *ophthalmia* of infants, when poured into the eye every hour, unless it is of gonorrhœal origin; but owing to alum possessing a solvent action on the corneal cement it may cause perforation, and should be used with caution, and it should not be used if there is a breach of surface; 1 in 100 makes a valuable gargle for *relaxed throat*, a lotion for secreting *wounds*, and an injection in *gonorrhœa* and *leucorrhœa*. It has been found beneficial in membranous *croup*, and insufflation of the powder is useful in *chronic catarrh* and *nasal discharge*. The glycerin is a valuable local application to *enlarged tonsils*, but is said to injure the teeth.

R. *Glycerini Aluminis* ʒj.

Glycerini Acid. Carbol. ʒiii. *Misce.*

Fiat applicatio. *Signa*—"To be brushed twice a day over the enlarged tonsils."

2 drs. Tinct. Iodi may be substituted for the carbolic glycerin.

Ammoniacum is a stimulating expectorant which has fallen into disuse, but which is of great value in assisting the *aged* and *emphysematous* in getting up with greater ease the tough, viscid secretion of the chronically inflamed mucous membrane. Some of its constituents are excreted by the membrane, depriving the secretion of its adhesiveness. Long experience of its effects in a large infirmary of *aged* invalids convinced the writer that in some way it greatly facilitates expectoration, and assists *wheezing*, in doses of 10 grs. to ½ dr., rubbed into an emulsion with warm water. Larger doses act as a purgative; and externally it acts as an absorbent in chronic *adenitis* and *joint swellings*, and may produce irritation or skin eruptions.

Ammonia, when applied externally, is a rubefacient or vesicant. A small blister may be produced in a few minutes by laying a piece of lint, soaked in the strong solution, on the skin, and rapidly covering it with a watch-glass. Its vapour, applied to the nasal membrane and respiratory tract, acts as a

powerful irritant and stimulant, by reflex action raising the blood pressure throughout the body, and is useful in *syncope* and conditions arising from *shock*. Internally, free ammonia, or its carbonate, acts as a powerful diffusible stimulant, directly exciting the heart, and adding temporary tone to the circulatory and nervous systems; hence, in cases of *sudden depression*, in *chloroform poisoning*, and in *desperate exhaustion*, a drachm of the dilute liquid, mixed with twice its bulk of water, should be injected into a vein. Its action being the same when thrown into a vein or swallowed, shows that it is not likely that it is neutralised before absorption (perhaps owing to its high diffusive power), and it probably acts directly on the cardiac nerves, and afterwards on the entire nervous system, and is partly eliminated by the bronchial mucous membrane, thinning its viscid secretion. It is converted into urea in the blood, and some of it may be oxidised and appear as nitric acid in the urine, thus very notably differing from the fixed alkalies, which markedly render the urine alkaline.

In poisonous doses ammonia causes general convulsions, somewhat resembling those seen in strychnine poisoning, but these are probably of cerebral as well as of spinal origin. The respiratory centre is markedly stimulated along with the cardiac mechanism.

Rossbach found that a *very weak* solution of ammonia painted over the mucous membrane of the trachea in a living animal, caused a decided and deep injection of the entire surface, and resulted in an increase of the mucous secretion. Strong solutions caused excessive hyperæmia and secretion, and finally a croupous exudation on the surface. Other alkalies produced very different results.

It should be injected where there is strong reason for supposing that a *clot of blood* has formed in the heart or any of the great vessels, as it aids its solution.

Carbonate of Ammonium acts like the free gas. It is emetic and purgative in large doses; and in quantities of about 8 grs., diluted freely, acts as a most efficient stimulating expectorant and general diffusible stimulant in all prostrating febrile conditions, its administration in *measles* and *scarlatina* being followed sometimes by most satisfactory results, even reducing the temperature. It is just possible it acts by destroying the morbid poison in these cases, as it does in *wasp stings* and *insect bites* when applied locally. It is not admissible in typhoid states with ammoniacal breath. The utility of its injection in *snake bites* is doubtful.

Acetate of Ammonium Solution, or Spirit of Mindererus, acts, after absorption, upon the skin, causing diffuse diaphoresis, and is especially useful in all the *feverish conditions* of childhood. Its action will concentrate upon the kidneys if the patient's skin be kept cool. It possesses the curious power, in wine-

glassful doses, of counteracting the immediate effects of *drunkenness*, or, in emergency, a teaspoonful of the carbonate in a glass of vinegar acts equally well.

A mixture containing 2 ozs. of acetate of ammonium solution, 2 drs. of acetate of potassium, 4 drs. of spirit of nitre and camphor water, with a little syrup, to 8 ozs., affords the most satisfactory and harmless diaphoretic, or febrifuge combination, in passing *febrile conditions*, or while awaiting a definite diagnosis in the more serious feverish states. The solution of the citrate has the same action. (See R. on p. 315.)

Benzoate of Ammonium is a diuretic, acting like benzoic acid, and, like it, passing out as hippuric acid in the urine. It is more active than the acid. Dose—10 to 20 grs. in water.

Eromide of Ammonium resembles the corresponding potassium salt in action. (See under Bromum.) It is useful in *whooping-cough*, adding to its antispasmodic an expectorant action, and possessing sedative influence over the mucous membrane of the pharynx and larynx. The writer has found it in hospital practice the best routine remedy for this disorder in children, combined with expectorants, like hippo and squill. It must, however, be given freely; a child 1 year old may get 3 grs., or in bad cases it may be pushed till drowsiness and marked sedative effects are produced.

Chloride of Ammonium is a useful expectorant when taken internally, and is most valuable when sucked in the mouth in small pieces, or, more elegantly, in tablets, one of which, placed in the hollow above the last upper molar between the cheek and the gum, where it slowly dissolves, will be followed by a free, painless, and often silent expectoration of mucus and checking of the cough. It often permits the subjects of *bronchial irritation* to freely expose themselves to the cold, damp, and even foggy atmosphere of a severe winter.

The writer proposes the term Ciliary Excitants for remedies which appear to have this effect upon the expectoration.

In *catarrh*, after the acute stage, they will be found very useful, and they run no risk of upsetting the digestion. It becomes a difficult question as to the way in which these substances act. One thing, however, is certain, that it is not by absorption, since the same effect, though in a *much less* degree, may sometimes be produced by sucking substances absolutely insoluble, as bits of glass, rubber, etc., and some of the soluble remedies produce no effect when swallowed in mixtures even in large doses, so that one is forced to the conclusion that they act by reflex action. Two conditions appear necessary to produce a *decided* effect upon the secretion—viz., the substance should be *soluble* in the fluids of the mouth, and should produce an impression upon the nerves of taste different from that continually being caused by food. Sugar, for instance, will not

affect the secretion, but, if flavoured with an essential oil, it appears to possess some power.

The impression produced upon the terminal filaments of the glosso-pharyngeal, or the lingual branch of the fifth nerve, is conveyed to the centre in the medulla, whence it probably is communicated by branches of the vagus, or through the sympathetic system, to the mucous membrane, or bronchus, in which it may effect nutritive, secretory, or motor changes.

As will be explained in speaking of some expectorants, the probability of any remedy acting as an expectorant and increasing the quantity of bronchial secretion without influencing the cilia is slight. The cilia are parts of the same cell, the office of which is to secrete the mucus, and it is hardly in keeping with our present knowledge to suppose that the functional activity of the cells would be increased without influencing their prolongations—the cilia—even though the process of secretion should end in the death of the cell.

Chloride of Ammonium was found by Anstie to be useful in *neuralgia*, and to cut short the course of *migraine* attacks, in doses of 20 grs. It is useful in *chronic hepatic congestion*; in 20 gr. doses it always induces free diaphoresis, increases the flow of urine, diminishes portal congestion by depleting the congested abdominal viscera, and relieves hepatic pain. It relieves the vomiting in malignant disease of the stomach, and is an alterative in chronic *rheumatism* and *sciatica*.

Various forms of Chloride of Ammonium inhalers, in which the nascent salt is brought into contact with the diseased spot, are used in throat affections.

Phosphate of Ammonium is a diuretic, and is said to decompose the insoluble urate of sodium in the blood, forming urate of ammonium and phosphate of sodium, and is recommended in cases of *uric acid diathesis*.

Aromatic Spirit of Ammonia and *Liquor Ammonia* afford, the former especially, agreeable methods of administering ammonia. They should be always freely diluted.

Ammonia acts as a caustic or irritant poison when swallowed, the free gas causing serious laryngeal trouble (possibly requiring tracheotomy) and violent gastric irritation, forbidding the use of the stomach-pump.

Amygdala—the sweet almond—is sometimes used in medicine on account of its mild, demulcent effect when directly applied to irritated mucous membranes, but it is, however, chiefly employed as an agreeable vehicle for more potent remedies, or made into bread as a food for *diabetics*. The oil *expressed* from either variety is a bland, soothing application in *inflammatory skin affections*.

Bitter almonds are more active, containing, in addition to emulsin, which is also found in the sweet variety, a principle

called amygdalin. These two substances, when brought together in presence of water, act upon each other, the amygdalin splitting into two new bodies—prussic acid and volatile oil of almonds—the former of which, being a deadly poison, accounts for deaths after eating bitter almonds; and it explains the action of a lotion of bitter almond emulsion in stopping the itch of various skin affections.

Amyl Nitris.—After the inhalation of 2 to 5 mins. of this drug, the pulse is quickened, or sometimes doubled in speed, the arteries dilate, the carotid throbs, the face flushes, a strange sensation of fulness in the head and some mental confusion or giddiness are felt, and there is great general relaxation of the arterial walls, with diminished blood pressure, the effect passing off in a few minutes. If a poisonous dose be administered to an animal, the quickened heart and respiration become slower, and may finally cease from paralysis; tetanic cerebral convulsions occasionally arise, the temperature falls, and the blood pressure becomes *nil*; the blood assumes a *characteristic chocolate colour* from the formation of methæmoglobin, which is deoxidised with greater difficulty than hæmoglobin itself. The dilatation of the arterioles is caused by the direct action of the drug on their muscular coats, or possibly also on the local vaso-motor ganglia.

Brunton *anticipated* its efficacy in *angina pectoris*, in which disease it has proved a blessing, lessening, when a few drops are inhaled, the arterial spasm, and, in the great majority of cases, producing relief from the agony of the attack. The glass capsules introduced and prepared by Martindale, and covered with wool, into which the amyl escapes when the capsule is broken between the thumb and fingers, afford the safest, most elegant, and rapid means for the administration of the drug. It is a safe remedy, and may be inhaled directly out of a phial, or sprinkled on a handkerchief, or swallowed on sugar.

It has been used sometimes with success in *epilepsy* while the attack is coming on, in *asthma*, *neuralgia*, *eclampsia*, *migraine*, and *sea-sickness*. It has been (generally with doubtful result) used to combat the heart failure in impending death under the influence of chloroform. It is, however, valuable in relieving the *dyspnœa* common in chronic valvular ailments, and in dilatation of the heart, in *pneumonia*, and *uræmia*.

Ringer directs attention to the extreme susceptibility of some patients to its action, and the writer knows a healthy man who has several times been inconvenienced by passing a building where the drug is frequently used in a varnish for pictures and show-cards. Isobutyl Amyl has identical action, and is obtainable in capsules.

Amylum—Starch—is nutritious ; but it is for its bland, un-irritating qualities, when applied externally or in enema, that it has been used in medicine. The powder dusted over *erysipelatos* or *excoriated surfaces* acts as a soothing coating, shielding the part from the action of the air or irritating secretions. Occasionally the preparation with glycerin irritates the skin. Starch is an antidote for iodine.

Anethum and Anisum—Dill, Anise, Coriander, Fennel, and Caraway are identical in action. They are powerful antiseptics. They are in large doses general stimulants, and are used in medicine as carminatives to relieve the *gripping of purgatives*, and the pain of *colic* and *flatus* in children, for which purpose anise is most used. They probably act in these latter cases as antispasmodics by reflex action ; in small doses they increase the secretion of gastric juice, and probably also that of the pancreatic fluid, and all possess feeble expectorant powers by stimulating the respiratory membrane during elimination by the breath. In full doses they have weak narcotic powers, but if injected directly into the circulation they are powerful cardiac depressants.

Anthemidis Flores.—Chamomile is a stomachic bitter, improving the appetite, and indirectly aiding digestion by increasing the vascularity of the gastric mucous membrane ; in larger doses, especially if warm, the infusion is *emetic*. Its chief use is in *atonic dyspepsia*. Externally, a warm fomentation is a popular remedy in the early stage of inflammations and sprains. The oil is a general stimulant and antispasmodic in 5 min. doses. It diminishes reflex excitability, and has been found useful in *sick headache*.

Antimonium resembles arsenic in many of its pharmacological actions, and the chloride is a powerful escharotic. The tartrate is the salt generally used in medicine on account of its greater solubility and activity.

Externally, it reddens the skin, and brings out an eruption of pustules somewhat like *smallpox* ; each pustule commences at the minute opening of a hair follicle or sweat gland. Its counter-irritant action is uncertain, and liable to be followed by scars.

In large doses it is a violent irritant poison, producing vomiting, inflammation of the digestive tract, finally great prostration and paralysis of the motor and sensory nerves from its direct action on the *cord*. The heart is paralysed, the arterial pressure falls finally to *nil*, and the respirations become reduced.

In medicinal doses its action varies with the quantity administered. In $\frac{1}{2}$ gr. doses it slightly reduces the force of the pulse by its direct effect upon the heart, and acts as a diaphoretic, causing free perspiration, probably by affecting the

nerve supply of the sweat glands, and it increases the secretion of the bronchial mucus. The latter effect is one of the most important of the drug, and places it in the first rank of true expectorants. It would appear that the same change occurs in the mucous membrane, as is seen in the skin, and this is especially likely, as we know that the gastric and intestinal mucous secretions are likewise increased. It may thus be said to cause the bronchial surface to sweat. In slightly larger doses— $\frac{1}{4}$ to $\frac{1}{2}$ gr.—nausea is excited, and the heart's action is diminished, antimony acting as a cardiac sedative; the pulse gets soft and weak, arterial tension is lowered, and general relaxation of all muscular structures supervenes; and if the dose is repeated, or 1 dose of 1 to 3 grs. is given, active vomiting takes place, with great depression and intensification of the former mentioned effects.

Its emetic action follows either after it is swallowed or injected into a vein, and experiment shows that it acts both by *directly* influencing the vomiting centre, and by irritating the *terminal filaments* of the pneumogastric and exciting *reflex action*. If introduced into the stomach, a much *smaller* dose of the drug will produce vomiting than if injected into a vein, and the smaller dose by the mouth will act *quicker* than the larger dose by the veins; this goes to prove that its *local* action is the more important factor in emesis than its effects upon the vomiting centre, notwithstanding that Majendie induced vomiting by injecting it into an animal after the removal of the stomach. It weakens the heart by affecting the ganglia, nerves, and muscle. It is eliminated by the glands of the stomach, intestines, and bronchi, and the urine and bile, and affects the cells in the skin like arsenic when given in poisonous doses to frogs, only its action extends deeper than that of arsenic. A considerable proportion of the entire amount ingested appears in the fæces owing to its elimination by the intestinal tract, and it readily passes out in the milk of nursing mothers.

Such, then, being the *physiological* action of tartar emetic, its *therapeutic action*, or the effects which it produces in diseased conditions, can be for the most part anticipated from this. Thus, in febrile conditions, with a hot, dry skin, its diaphoretic action will be called to our aid; in bronchial affections, with tenacious adhesive secretion, it produces great benefit; whilst in acute inflammations like *pneumonia* and *pleuritis*, with high, bounding pulse, great fever and vascular excitement, it is invaluable from its cardiac sedative action.

In acute inflammatory affections of the respiratory tract, especially in *non-diphtheritic croup* and *laryngeal spasmodic diseases*, it is our sheet anchor, allaying spasm, reducing fever, and directly cutting short the progress of the disease.

The following may be given in spasmodic croup to a child 1 year old :—

R. *Antim. Tart.* gr. i.
Vini Ipecac. ℥iv.
Syrupi Simp. ℥j.
Aquam ad ℥iii. *Misce.*

Signa—"A teaspoonful every fifteen minutes till vomiting is produced; then every 1, 2, or 3 hours as required."

It should not be given in *diphtheria*. It is called an anti-phlogistic from its power of combating *acute inflammations* of a sthenic type, and it is probable that its action in such cases is only what can be accounted for by its effects upon the heart's force and frequency, and the diminution in the respiratory movements and vascular tension.

In the violent delirium of *fevers*, Graves employed it in $\frac{1}{4}$ gr. doses, combined with as much opium, every hour or two. In *delirium tremens*, when opium failed totally to produce any sleep, the writer has seen it speedily act when $\frac{1}{4}$ to $\frac{1}{2}$ gr. of this salt was added.

In the *acute bronchial affections of childhood*, antimony continues to be the best remedy we possess. Combined with hippo, or given alone, in the form of the wine, $\frac{1}{2}$ to 1 teaspoonful is an emetic for a child 1 year old, and 5 mins. every hour afterwards keep up the expectorant effect; but the dose can be easily regulated by keeping the little patient on the borderland of vomiting. Owing to the slowness of its action and the great prostration which follows, it is not indicated in poisoning.

Tartar emetic was formerly employed to produce muscular relaxation in *dislocations* and *hernia*, a practice which has melted away before the advance of chloroform. It is still used in *rigidity of the os*, and is valuable in *acute synovitis* and *orchitis*. Great tolerance of the drug may be observed in feverish conditions, probably owing to the toxic effect of the poison (causing the *fever*) on the nerve centres.

Antimonial or James's Powder, the active principle of which is oxide of antimony, possesses most of the properties of the tartrate in a feeble degree. It is used in 5 gr. doses in febrile conditions for its mild diaphoretic qualities.

Sulphurated Antimony possesses all the powers of the tartrate, only in a less degree. It has *alterative* properties, which have gained for it some reputation in *syphilis*, when given with calomel in Plummer's pill. It is most uncertain in action on account of its insolubility.

Apomorphine is a true emetic, and possesses none of the narcotic properties of morphine, though the statement is made that small doses which do not cause vomiting ($\frac{1}{32}$ gr.) are hypnotic. The writer has never noticed this effect when giving the

drug as an expectorant, though often large doses ($\frac{1}{2}$ gr.) did not cause vomiting. When given by mouth or injected hypodermically it produces vomiting, and very *much less* is required by this latter method than if administered by the mouth. It acts *directly* upon the vomiting centre, and is much more rapid than tartar emetic, and its action is not followed by nausea or prostration, hence it is the most efficacious emetic known in cases of poisoning, especially in cases of narcotic poisoning, when the power of swallowing is lost; the dose hypodermically *should never exceed* $\frac{1}{10}$ gr. It has little, if any, effect upon the peripheral nerves in the stomach. It stimulates and then paralyzes the motor, cardiac, and respiratory centres and muscular fibre, without affecting motor or sensory nerves.

Apomorphine is invaluable as an expectorant. Rossbach, by exposing the interior of the trachea in a living animal, and watching the effect of various substances, studied the action of expectorant remedies from an entirely original point of view. He found that *emetine*, *apomorphine*, and *pilocarpine* produced a rapid and profuse pouring out of the mucous secretion, which, especially in the case of the latter drug, was most abundant and liquid, and filled the tubes almost to suffocation. He demonstrated that, contrary to the accepted opinion, this great *hypersecretion* was not preceded or accompanied by *hyperæmia* of the membrane; these drugs were proved by a severance of all the laryngeal nerves, and by a ligaturing of the trachea itself, to act in no *centric* or *indirect* way, but to exert their influence by *acting directly upon the peripheral endings* of the gland-nerves, the gland cells, or the minute ganglia, to which they were carried by the blood stream.

Apomorphine was found to give rather better results than *emetine*, while the constitutional effects of *pilocarpine* prevented its use as an expectorant.

Rossbach states that these drugs are the prototype for expectorating patients, especially in *chronic inflammations* accompanied with dryness of the mucous membrane, wrongly called *catarrhs*, and also in *acute catarrhs* attended with very *viscid secretion*. In the *bronchitis* and *croup* of children he convinced himself of the excellent and life-saving action of apomorphine.

He says that "it is only since I learned the excellent effects of apomorphine that I can say I really like to treat catarrhs, even of the most obstinate kind, and no longer, as before, approach the case with a sense of therapeutic powerlessness."

The writer has employed it very extensively since 1881, and can speak of it quite as strongly as the above. He has used it alone and also combined with morphia, and finds it the only drug of real value in dealing with some forms of *bronchial irritation*, caused by the inhalation of flax-dust, in operatives employed in the manufacture of linen, whilst it afforded the

best results in ordinary *dry catarrhs*, and in *bronchial asthma*. It must be, however, used with caution, from its risk of depressing the heart and possibly causing œdema of the lung. $\frac{1}{8}$ gr. every 3 or 4 hours in camphor water, with or without morphia or ipecacuanha, may be given. Murrell has given 1 gr. 3 or 4 times daily without nausea resulting.

A 1 per cent. solution freely dropped into the eye will cause anæsthesia like cocaine, but its action is apt to be followed by severe irritation.

Aqua.—A few of the therapeutic effects of water may be mentioned, though its place in the B.P. is entirely owing to its pharmaceutical properties.

Water is of great use in fever, in the form of ice, a bit of which sucked in the mouth allays thirst by reflex action. It also, probably by reflex action, stimulates feebly the cerebral circulation; and it may increase the quantity of gastric juice before being swallowed. In *ulcer* and *irritable conditions of the stomach* it soothes by diminishing sensation, while it checks hæmorrhage by contracting the muscular tissue of the ulcerated artery.

In $\frac{1}{2}$ to 1 pint doses, cold water before food in the morning acts as a laxative, by adding water to the fæces, which it probably does by being alternately absorbed and eliminated again as it passes down the canal, stimulating the intestinal glands. The writer has seen perforation occur in gastric ulcer very soon after the administration of *very hot water*, a practice which has become popular in the treatment of constipation and dyspepsia, and which he believes to be dangerous, and liable to produce ulceration. Introduced into the rectum as an enema, water washes out the colon, and is the safest remedy in impacted accumulations; but to be administered properly, it should be given at about 98°, slowly injected, with the patient lying on the left side. From 3 to 6 pints can be used with safety, if not jerked up; and benefit will be found by turning the patient over gently on his right side, or on his hands and knees, or by raising the pelvis, so that the fluid gravitates along the colon to the valve, the operator pausing from time to time to allow the temporary pain or spasm to subside.

Of a different class are enemata of cold water, or of water containing castor oil, turpentine, soap, etc. Here the intention is to excite reflex contraction, which one endeavours to avoid in the former case, and less than a pint will be enough. Still more different are nutrient enemata, which are intended to be absorbed. They should not be more than the bulk of a few ounces, and should be of the consistence of thin arrowroot. The addition of a little laudanum assists in their retention till digestion and absorption occur.

Water, when taken in large quantity, acts as a diuretic, by

washing out the kidneys and bladder, and copious draughts of lukewarm water are emetic.

Externally, water is largely used in medicine, and its mode of action depends upon its temperature and the method of application. Bartholow stated that on immersing one hand in cold water a corresponding reduction of temperature occurred in the other hand, and inferred that changes in a similar way occurred internally.

On immersing the body in cold or tepid water, refrigeration, especially in feverish conditions, occurs from the actual abstraction of animal heat, water acting as a good conductor; there is probably also diminished thermogenesis. The vessels of the skin are caused to contract, and in the warm bath they relax. The hot bath at first acts as a powerful stimulant, but, if indulged in for too long a period, the heat of the body causes cardiac weakness, and prostration and fainting follow. The hot and warm baths, acting so thoroughly on the skin and increasing its secretion, are used to cause excretion of water and urea in *dropsies*.

Ice is largely used in surgical practice as an application to inflamed parts, as in *orchitis*, *arthritis*, *hernia*, *head affections*, etc., acting as a sedative, diminishing the amount of blood in the part, both by direct and reflex action; and water, iced, tepid, and cold, is used for dressing and irrigating wounds.

The following are the most common forms in which water is used externally as a remedial measure:—

The *Cold Bath*, which is water about the temperature of the air, or on an average of between 45° and 66° F., is used in *fevers*, and as a powerful tonic in various diseases of the nervous system. The tonic effects of the cold sea bath are most marked, and are, generally speaking, in proportion to the shortness of the immersion, as seen in the amount of stimulation and healthy reaction. The cutaneous vessels are contracted, driving more blood into the organs; the after-effect is a feeling of exhilaration and warmth from dilatation of these vessels, and probably also from the elimination of waste products due to increased diuresis.

The *Tepid Bath* is water about 85° to 90°, also used in fevers. It is sometimes called the *Indifferent Bath*.

The *Warm Bath* is water about 98° to 100°, and the *Hot Bath* is water at 103° to 108°, used in *dropsies*, *kidney diseases*, *catarrh*, attacks of *renal* and *hepatic colic*, etc., while in the *Turkish Bath* various apartments are heated from 100° to 200° F. It is used in *secondary syphilis*, *rheumatism*, etc. The *Russian* differs from the *Turkish* in the fact that it really is a vapour bath, the air of the apartment being quite saturated with aqueous vapour.

The *Sitz* resembles the *hip bath*, being a vessel in which the pelvis and hips can be immersed in water at any temperature,

the remainder of the body being free. It is used in the sitting posture for *uterine ailments*, *amenorrhœa*, etc.

The *Sponge Bath* is a shallow vessel, generally of cold water, in which the patient sits or stands while the surface of the body is sponged freely over.

The *Douche* is a sudden application with force, of a stream of water (generally cold) to the surface of the body; an invaluable remedy in the *coma of alcohol*, *sunstroke*, *delirium*, *insomnia*, etc. It differs from the *shower bath*, which is the impaction of a multitude of drops, or minute streams, from a height, and from *cold affusion*, which is the pouring of a liberal volume of cold water over the surface of the body, as in *hyperpyrexia*, *alcoholism*, and *laryngismus*.

The *Wet-Pack*, so much used in hydropathy, consists in enveloping the naked body in a four-ply sheet wrung out of cold water, and spread flat upon a hard mattress, upon which the patient reclines, the ends of the sheet being carefully tucked in on each side, and the feet completely covered, after which several blankets are placed upon the top of the sheet; after 10 minutes the sheet is changed. The pack lasts half an hour or more, and is followed up by friction with dry towels.

The *Hot Wet-Pack* is managed in a similar way with hot water, and resembles the various *steam* baths used in dropsies, and which may be made by boiling water with a spirit lamp under a cane-bottomed chair, upon which the patient sits, surrounded completely, except the head, by a blanket.

The *Mustard Pack* is managed like the *Hot* pack by infusing a handful of powdered mustard in the hot water in which the sheet is immersed.

Sir J. Simpson's poor man's bath is made by filling 6 or 8 soda-water bottles with hot water, drawing over each a stocking squeezed out of hot water, and placing them alongside the patient under the bed-clothes. They make a good bath in about 30 minutes.

The *Hot-Air Bath* is made in a similar manner by burning a spirit lamp under a chair, or by introducing under the bed-clothes any of the spirit lamps made for the purpose. These latter are invaluable in *Bright's disease*.

The *Nauheim Bath* owes its therapeutic virtues to free carbonic acid in conjunction with the sulphides present in it.

Fomentations are merely local baths, or circumscribed hot packs, in which medicinal substances are generally introduced.

Cataplasms are similar applications of a semisolid consistence, composed of various medicated ingredients.

It is in the treatment of *hyperpyrexia* where the temperature of the body rises to 106° or 108° and remains so, death being almost certain in such cases if let alone, that the judicious application of cold water saves life—as in *typhus*, and more especially in *rheumatic fever*. The patient is placed in a bath

of about 98°, and cold water or ice is added till the bath cools to 70° or 60° F., watching the temperature of the patient, as indicated in the rectum. When a fall occurs of 3 to 5 or more degrees, he is removed, wiped dry, and put to bed, where the temperature continues to fall for half an hour or more. The time in the bath varies from 5 minutes to 1 hour, and it may be repeated every 2, 3, or 4 hours (if necessary) when the case is severe. The *routine* use of the cold or tepid bath in *typhoid fever*, when the temperature rises above 102°, has greatly reduced the mortality of this disease; *cold sponging* may be substituted in mild cases, or *iced compresses* may be applied.

Water at a temperature of 112° effectually checks *uterine hæmorrhage*, when injected into that organ.

Aquapuncture, or the injection of water by the ordinary hypodermic needle under the skin, or into the substance of muscles, is often followed by surprising results. Its action depends upon its nutritive effect on the nerves of the part, for pain in a superficial nerve is often at once alleviated, and it will produce this effect without causing any irritation around the puncture. Bartholow derived good results from the injection of water into the substance of paralysed muscles.

For superficial pain 30 mins. should be injected at the pained spot and frequently repeated—5 times within an hour if necessary.

Araroba. (See Chrysarobin.)

Argenti Nitras is a powerful corrosive poison, precipitating the albumin of all the mucous membranes with which it comes into contact, and when applied externally, either in the form of solid stick or mitigated caustic, it destroys the tissues, and is used to paint over exuberant granulations, its destructive effects being followed soon by an *altered action* of the parts, a result which is utilised in many chronic unhealthy inflammations, as in *cystitis* and *gonorrhœa* (1 gr. to 1 oz.), *conjunctivitis* (10 grs. to 1 oz.), *ulcers* (30 grs. to 1 oz.), and *relaxed pharyngeal catarrhs* and *tubercular and other ulcerations of the larynx, pruritus*, etc. (10 grs. to 1 oz.). It destroys *tinea*, *warts*, and *chancres*; and the *poisons of rabid animals and snakes*, if applied in time. As a caustic for rabid bites the nitrate of silver is the most painful, and, according to the opinion of Roux, as expressed to the writer, one of the least reliable. Owing to its precipitation by albumin, the drug is unable to penetrate for any depth; hence the introduction of the organic salts. (See under Argentamine, etc.)

Carter, in *ophthalmia*, introduces a cocaine disc into the eye, and in 10 minutes applies with a *fine* camel's-hair pencil a small quantity of a (5 to 10 grs. to 1 oz.) solution of the nitrate, confining its action, if necessary, to the region of the ulcers. With a larger brush *ophthalmia neonatorum* may be painlessly

treated. Cr  d  's method of preventing this latter disease is to instil a 2 per cent. solution after birth.

Internally, nitrate of silver acts in large doses as other corrosive poisons, causing inflammation or destruction of the gastro-intestinal mucous membrane. In addition, however, it produces marked *nervous* symptoms, as *paralysis*, *spinal convulsions*, *dyspnoea*, etc., from its action upon the centres. It has been successfully used in large doses ($\frac{1}{4}$ to 2 grs.) in *ulcer of the stomach*, with the view to cauterise or alter the character of the process going on in and around the ulcer, its use being not free from danger. In solution it has been recommended as an injection in *rectal ulceration*, *colitis*, and *dysentery*. In *dyspepsia* and *vomiting of yeasty fluid* it often acts beneficially. As it coagulates albumin, it possesses astringent qualities, and hence is used in *diarrhoea* depending upon ulceration; and its effect upon the gastric nerves, in doses of 1 gr., in bread-crumbs pills, is sedative. It has been given in *chronic affections of the spinal cord*, in *paraplegia*, and *locomotor ataxy*, and in *epilepsy* when bromides fail, but the great barrier to its use in such diseases is the permanent dark discoloration of the skin (argyria) which it produces. When it reaches the stomach it is precipitated by the chlorides abounding in the gastric juice, and likewise when applied to a moist surface it whitens it, owing to a film of the chloride being formed, which is afterwards changed into the black oxide. Cushny believes that none of the drug is eliminated; the small portion absorbed remains imbedded in the tissues, whilst the unabsorbed portion passes out in the f  ces. It seems to have some influence on the blood in *purpura*.

R. *Argenti Nitratis* gr. iv.
Kaolini. gr. xxx.
Vaselin. q.s. *Misce.*

Fiat massula et divide in pilulas xvi. St. i. ter die, ante cibos.

Argenti Oxidum resembles closely the nitrate, except in its external effects. It is less irritating, and has been used in 1 gr. doses in *gastrodynia* and for its astringent properties in h  morrhages, especially *menorrhagia*, and for its alterative effects upon the nerve centres, in *epilepsy*, *ataxia*, etc. It must not be combined in pills with substances like creosote or phenol, as explosion is liable to occur.

Armoracia—Horse-radish root—when chewed, acts as a stimulant to the salivary glands, increasing their secretion—hence it is a Sialagogue. When swallowed it increases the gastric secretion, acting as a stomachic, and after absorption it is thrown out by the kidneys, stimulating these organs in its passage—thus it is a true Diuretic. The secretion of the skin is also increased. When applied externally it is a Rube-

facient, causing redness, like mustard, only less in degree. The volatile oil of mustard is formed when horse-radish root is mixed with water.

Arnica.—Preparations of the root or flowers, when applied to the skin, cause irritation, which may take on serious or even fatal inflammatory action, extending to distant parts, and simulating erysipelas. Its use is contra-indicated whenever the skin is broken. $\frac{1}{2}$ oz. of the tincture to 1 pint water is strong enough for ordinary use. Diluted, these preparations are said to act in such a way as to cause absorption of extravasated blood, by their effect on the absorbents of the skin, hence they are applied to *sprains* and *bruises*; most of the benefit, however, may be justly ascribed to the spirit generally used along with them. Internally, arnica has been credited with many fancied virtues. It acts as an irritant to the stomach and gullet, and produces diarrhœa, and in large doses diminishes, like aconite, the respiratory and circulatory functions; it has been recommended in *fevers* and in *delirium tremens*. It produces in poisonous doses marked nervous prostration, muscular weakness, spasmodic movements of the limbs, and collapse. It is at best an uncertain and often a dangerous remedy, and is justly falling into disuse, and should be omitted from the B.P.

Arsenic. (See Acid. Arseniosum.)

Asafetida acts as a stimulating expectorant, closely resembling the onion in its power of increasing the secretion of mucus from the air passages, probably during its excretion by this channel; and it blunts the sensibility of the respiratory centre, diminishing the breathlessness of *emphysema*, and by diminishing the flatus in the digestive tube, it gives more room to the easily overburdened lungs. It is, however, in *hysterical* ailments that it is chiefly employed, controlling the irregular and erratic nervous phenomena seen in that disease, as some suppose by the moral influence of its disgusting and intolerable odour.

It acts as a mild purgative, and is very beneficial as an enema in *flatulent colic*. The best preparation is the Fetid Spirit of Ammonia, in $\frac{1}{2}$ dr. doses.

Atropine and Belladonna when applied locally act as anodynes by lessening the sensibility of the sensory nerves. Small doses cause dryness and redness of the throat and mouth, dilated pupils and disordered vision, and sometimes a peculiar scarlet eruption. By stimulating the nerve centres, a large dose produces active brain excitement, intoxication or pleasing delirium, hallucinations, illusions, a feeling of lassitude, and eventually sleep, whilst at the same time there is paralysis of the peripheral motor nerves. The heart becomes excited and the vascular system stimulated (standing several feet from a patient the writer has heard the heart sounds); this stimula-

tion is probably caused by the action of the atropine upon the inhibitory trunk of the vagus or its peripheral fibres in the heart. Ultimately the heart muscle is paralysed, and stops in diastole, the arterial tension is at first raised and afterwards diminished, the secretion of gastric juice, milk, saliva, bronchial mucus, and sweat is stopped, owing to paralysis of the nerve endings in the glands. At first there is forcible expulsion of urine, but soon the bladder becomes partially paralysed, and swallowing is difficult. The movements of the stomach, intestinal tube, uterus, spleen, bronchi, and all organs containing unstriped muscular fibres are diminished owing to depression of the nerve endings, upon which atropine has a distinct selective action. The pupils are widely dilated; the voluntary muscles are not directly affected unless by enormous doses. The temperature is markedly raised by large doses. The drug is excreted in the urine, and acts as an anodyne on the vesical surface.

The respiratory and vaso-motor centres are stimulated by full doses, but paralysed by poisonous doses. In large doses the drug paralyses the sensory terminations of the vagus in the lungs and the motor terminations in the bronchi.

When dropped into the eye atropine causes marked dilatation of the pupil by passing into the anterior chamber and paralysing the filaments of the third nerve supplying the sphincter muscle of the iris; the muscular fibres of the sphincter are also directly weakened, and the dilator muscle is at the same time stimulated through action of the drug on the sympathetic. *The action is entirely a local one.* If pain be present it is at once relieved. There is also marked loss of accommodation, resulting from paralysis of the ciliary muscle, which fails by loss of tension to act upon the suspensory ligament, so as to cause the lens to become more spherical; the eye is consequently focussed for distant objects, and the *intra-ocular tension is increased*, hence its contra-indication in glaucoma.

Atropine causes mydriasis when given internally, by being carried in the blood to the eye itself, and there acting precisely as when applied locally. The pupil of an excised eye dilates on the application of atropine.

The drug stops the secretion of the saliva by paralysing the ends of the nerves distributed to the gland cells which come from the chorda tympani, but it does not paralyse the vaso-dilating fibres contained in this nerve and stimulation of the sympathetic restores the secretion, proving that the secretory cells themselves are not paralysed. It has been advocated in various acute *inflammations* and in *spinal diseases* on the theory that it contracts the small bloodvessels. From its power of stopping the secretion of milk, it is of the greatest use in checking congestion and inflammation of the breast after weaning. Moreover, as it tends to prevent suppuration by its action on the white blood corpuscles, like quinine, a local

application to the breast is of great value ; it may be given internally at the same time. In *small* doses it increases the action of purgatives by weakening spasm of the muscular fibres. It is recommended on this account in *constipation, obstruction of the bowels, impacted gall-stones, renal calculi, and asthma*. Both internally and locally it checks *sweating*, and is a favourite remedy in the *night sweats of phthisis*. (Ext. Bellad. Vir. gr. $\frac{1}{4}$, Zinci Oxidi gr. iii.) This pill will remove *urticaria* and ameliorate *acne*.

It diminishes the bronchial secretion, and has been given for the *profuse expectoration of bronchitis*. In the hands of some physicians it has been found to relieve cough and spasm of the bronchial tubes. This has not been the writer's experience, nor has he found it of benefit combined with digitalis in cardiac weakness. Old people are affected sometimes by most minute doses. From its anodyne action it is beneficial in *neuralgia*, and Anstie advocated its internal use in *lumbago, sciatica, and neuralgia of the pelvic organs*. Pushed almost to the extent of showing its poisonous effects, it is curative in *whooping-cough*, and children bear very large doses. It is by far the best remedy in *incontinence of urine* in children, probably by its partially paralysing the muscular coat of the bladder and diminishing the sensibility of the mucous surface.

Belladonna and atropine are used as antidotes in opium poisoning, but the dose must be small and only such as shall stimulate and not depress the respiratory centre. The addition of $\frac{1}{2}$ or 1 min. of atropine solution to each hypodermic dose of morphia is a wise routine practice.

For nocturnal incontinence in a child 5 years old :—

R. *Tincturæ Belladonnæ* ʒiv.
Syrupi Limonis ʒiv.
Aquæ (or *Aquam*) *ad* ʒvi. *Misce.*

Fiat mistura, cujus capiat ʒj. ter in die et hora somni.

Externally, it is used on account of its anodyne properties to relieve pain in *neuralgia* or to arrest the *suppurative process* in boils ; and the plaster, in addition to relieving pain, acts by putting the region to which it is applied to some degree on the same footing as an *internal part*, hence its value as a strapping for *enlarged glands and superficial joint affections*. It is useful in the form of plaster when worn over an irritable and pained heart. It should be remembered that belladonna is freely absorbed by the unbroken skin, and the strong standardised liniment and plaster have been the means of causing many deaths. Their use should be abandoned till they are reduced in strength by the authorities whose duties it is to revise the B.P. The best application to the inflamed breast is 1 oz. green extract of belladonna, 1 dr. hot water, and 7 drs. glycerin.

Squire's Chloroform of Belladonna made by percolating the root with chloroform (1 in 1) is a powerful anodyne application.

Aurantii Cortex is a mild bitter tonic, acting on the stomach in such a way as to give it increased tone, and it feebly stimulates the appetite. It is for its flavour, which is aromatic and pleasant, that it is chiefly used in medicine.

Aurantii Flores, in the form of Aqua, are only used for their agreeable perfume and flavour, though supposed to possess feeble hypnotic qualities.

Balsams of Peru and Tolu.—These substances are of little therapeutic importance; they act as stimulating expectorants, probably because they are eliminated to some extent by the bronchial mucous membrane, as they are to a still less extent by the other mucous surfaces, to which they act as feeble stimulants. Externally, the Peruvian balsam is a mild stimulating antiseptic application to *sluggish ulcers*, *bed-sores*, and *cracked nipples*, in which cases it is often mixed with castor oil in equal quantity. In a similar way it is a valuable parasiticide, and is a good remedy for the *itch* and for *pediculi*.

Baths. (See under Aqua.)

Belladonna. (See Atropine.)

Benzoinum.—A stimulating expectorant, acting, probably, on the relaxed bronchial mucous membrane, by which some of its volatile constituents are eliminated. It possesses all the properties of its active principle, Acid. Benzoic. (which see). The compound tincture, or Friar's balsam, is an invaluable antiseptic stimulating application to *ulcers and sores*, and is the best remedy for healing *tortuous sinuses* and *sinuous scrofulous tracts*, when injected (undiluted) with a fine syringe; it decomposes *fetid* secretions, and establishes healthy action in these troublesome affections. A piece of lint saturated with it is a valuable hæmostatic when applied to fresh *wounds*.

Containing benzoin, storax, and tolu, it is highly spoken of by Yeo, who has found it of great service in lessening the secretion and cough in *chronic bronchitis*; it may be prescribed with mucilage or tragacanth. (See p. 17.)

The vapour of the tincture has been found to cut short attacks of *catarrh* and *influenza* in a surprising way, it is said, even when inhaled directly from the bottle containing it, or if inhaled as a fine spray from the atomiser.

Benzol is only introduced into the B.P. as a solvent for india-rubber for the preparation of Charta Sinapis. It cleanses the hair of nits and pediculi and removes dandruff. It has been given internally in 5 min. doses in capsules in *pertussis* and *influenza*. (See also under Benzoline.)

Bismuthum.—All the bismuth preparations are poisonous when injected directly into the circulation, acting like arsenic and antimony, but as ordinarily employed in medicine the insoluble salts may be considered, when pure, to be harmless in colossal doses when swallowed. They act as direct sedatives, by coming in contact with the excoriated or irritated filaments of the nerves supplied to the mucous membrane of the stomach. The insoluble salts were held to pass entirely unchanged through the alimentary canal, but Wood has demonstrated that bismuth can be easily detected in the urine after their administration, and that there is not a doubt that traces are absorbed. The residue blackens the motions like iron. Whether the sedative action on the gastric nerves is owing to mere mechanical shielding of them from irritating secretion, or to some vital change in the nerve ending, induced by contact with the bismuth, or to the antiseptic power of the drug we do not know; but ample clinical experience has proved the value of these salts in all *painful gastric* affections, as *cancer, dyspepsia, ulcer*, and in *vomiting* from various causes. They are used also in *diarrhœa* in larger doses (1 dr.), and sometimes as a cosmetic, and as a soothing application to *eczema, intertrigo, burns*, etc., and have been used as an injection in *gonorrhœa*, and in *ulceration of the rectum*. The carbonate is the most useful preparation, being antacid, and may be safely prescribed with sodium bicarbonate, whilst the salicylate and subnitrate are decomposed by alkalies. It is also credited with astringent properties, and it is antiseptic; poisoning has been reported from the absorption of the insoluble salts when applied in quantity as a dressing to granulating wounds, by which it is readily absorbed, the symptoms being salivation, ulceration of the tongue and mouth, and gangrene of the palate. The writer never employs the liquor, having seen it so often aggravate all the symptoms for which it was prescribed. The recently introduced Salicylate is a valuable gastric sedative, and is frequently given in *typhoid fever*.

The peculiar phosphorus-like odour of the breath observed during a course of bismuth has been shown to be caused by the metal tellurium found in impure preparations.

A highly interesting adaptation of bismuth to medical and surgical diagnosis is now in daily use. The insoluble salts are opaque to the X rays, and after administering 2, 3, or 4 ozs. of the carbonate in emulsion the journey of the dose may be seen on a fluorescent screen from the gullet to the anus. In this manner stricture and diverticula of the gullet, gastric dilatation, and strictures of the intestine can be easily demonstrated. The subnitrate cannot safely be used in the colossal doses necessary for radiography.

As an application in irritable conditions of the nasal membrane, "Ferrier's Snuff" is valuable; it consists of Subnitrate

of Bismuth ʒvj. , Morphine Hydrochloride 2 grs., and Powdered Acacia Gum ʒii. See the R. on p. 309, containing bismuth. By the addition of a little morphia it may be used in any painful gastric disease with great benefit. The numerous non-official salts are described in the Non-Official Section.

Borax acts like boric acid in most respects. When swallowed it is absorbed, and acts in the blood like an alkali or antacid, and passes through the kidneys, which it stimulates, acting thus as a diuretic. It also affects the uterus, which it causes to contract and expel its contents; hence it has been used to *produce abortion* and to expel a *retained placenta*. Its *emmenagogue* properties, however, are uncertain, and it is for its local action that borax is generally used. Applied to a diseased *mucous membrane* it soothes pain and diminishes congestion, altering the action of the part. Its action has been in this case described as astringent, but, with our present knowledge, it seems better to confess ignorance, and call it a *local alterative*. It has been given internally in *epilepsy*, in doses of 10 to 20 grs. thrice daily.

Borax possesses antiseptic properties, but Boracic Acid is preferable for most purposes. These substances in the ordinary solutions employed in surgery appear to be only capable of *inhibiting* the growth of germs, as these flourish if removed from the action of the solution after remaining dormant for long periods when in contact with it. Of all the remedies we possess, none equal it for the painful *aphthous condition of the tongue and mouth* so often seen in childhood and infancy, and the glycerin of borax is decidedly superior to the preparation with honey as a basis. A little should be brushed over the child's mouth or smeared on by the nurse's finger several times a day. It is equally useful in *fissures of the tongue* in adults.

It is an invaluable remedy for *ulcerated nipples*, and possesses the advantage of keeping the infant's mouth healthy at the same time. A warm saturated solution applied to the scalp raises a lather like soap, and partially dissolves and effectually removes the dead epithelial scales. A solution of 1 dr. to 4 ozs. water makes a useful lotion in *itching* of the labium or anus, and a tablespoonful of the powder, or twice as much of the glycerin in 1 quart of water, proves valuable in *leucorrhœa* and *abrasions* or unhealthy states of the vagina or os uteri. It is recommended in *mercurial salivation* as a local application. The glycerin is a splendid lubricant for the rubber catheter.

Bromum in the free state is seldom used in medicine, the potassium, sodium, and the ammonium salts and the dilute acid only being official.

Bromide of Potassium is a sedative to the nervous system; it is diffusible, and after being like the other bromides changed into the soda salt in the intestinal tube or stomach, enters the

blood, whence it is carried to the brain and spinal system of nerves, producing drowsiness and sleep by diminishing the quantity of blood in the cerebrum and lessening reflex excitability in the cord and cortical motor centres, and at the same time depressing the sensory centres. According to Wright, the prolonged use of large doses causes degeneration of the cortical cells, commencing in the ramifications of the dendrons, upon which portion of the nervous system Gowers believes the drug has a selective chemical action. It produces partial loss of sensation and diminished reflex irritability in the back of the throat, which may be freely swept round with the finger (after a course of bromide) without exciting efforts to swallow or vomit. The diminished sensibility in the pharynx has been considered to be owing to the local effect of the salt as it is being eliminated by the mucous membrane of the part, and the same effect is produced by the application of a watery solution to the part.

Bromism is the name given to a group of varying symptoms following the prolonged use of the bromides, anæmia, mental dulness, sometimes approaching to, or actually passing into, a condition of mental weakness or dementia, unsteady gait, muscular weakness and prostration, dyspnœa on exertion, loss of sexual power, sleeplessness, fetor, and sometimes a smell of bromine from the breath, general diminished tactile sensibility, and eruptions of acne spots about the face and shoulders. Bromide of Potassium is eliminated through the skin, breath, urine, and fæces, appearing as bromide of soda. The bromides of potassium, sodium, and ammonium are almost identical in action, and may be combined, only the latter is of more use in *whooping-cough* and *respiratory spasmodic affections*. The soda salt, though not so active as the potash one, should always be selected for chronic cases, as the base soda is less depressing to the heart and circulation.

Therapeutical Action.—Bromide of potassium has been used in various *nervous* affections associated with convulsive movements, as in *epilepsy*; it is of greatest value in the worst forms, for the minor epilepsy or *petit mal* is often unaffected by it. In these cases the dose should be large—15 to 30 grs. three times a day—and animal food should be diminished or stopped during the use of the drug, which should be continued for 2 or 3 years in smaller doses after all trace of the disease has disappeared. 60 grs. a day of the soda salt may be administered for very long periods. 100 to 200 grs. may be given by the rectum in the *status epilepticus*. In smaller doses it is the safest treatment for *sea-sickness*. *Laryngismus*, *whooping-cough*, *asthma*, *delirium tremens* in its first stage, *acute mania*, *migraine*, *vaso-motor changes* (so common at the cessation of menstruation), *menorrhagia*, *dysmenorrhœa*, *nocturnal seminal emissions*, and *priapism*, are all decidedly benefited by the

bromides. Its utility in these conditions is to a large extent explained by its power of diminishing reflex action. It appears to have more curative power with the vigorous than in the anæmic; this is particularly true in *neuralgia*. There is no agent so uniformly beneficial in *aural vertigo* and *tinnitus*.

In *sleeplessness*, arising from prolonged mental labour or worry, the bromide is invaluable. A full dose of 40 grs. at bedtime, repeated in 1 or 2 hours if necessary, produces refreshing sleep so different from that of any other narcotic as to lead one to believe it acts on the brain like natural sleep, which is characterised by anæmia; hence one explanation of its action in *mania* and affections accompanied by symptoms of *congestion of the head*. It sometimes relieves *cerebral vomiting*, and the *vomiting of pregnancy* when other remedies fail, and it stops the *convulsions* of several diseases, as *acute hydrocephalus*, etc., without in any way curing the maladies. Occasionally it has produced good results in some forms of *diabetes*.

It has been used in *tetanus* and *strychnine poisoning* in doses of 1 to 4 drs. Acne follows its use very often, and when it attacks the face is a barrier to its exhibition. This is largely prevented by adding a little arsenic, as in the following formula. The writer has often seen severe erythema nodosum follow its administration, and a host of cutaneous ailments have been attributed to it.

It should not be given in anæmic conditions, and it is worth remembering that it greatly increases the hypnotic effects of chloral, opium, and hyoscyamus. Large doses of bromides have been successfully given (2 drs. every two hours) with the view of causing prolonged sleep or coma, in the treatment of the *opium habit*, and it is reported that the patient sometimes awakes cured and free from opium craving. The mixed bromides are often preferred in epilepsy.

(FOR EPILEPSY IN AN ADULT.)

R. *Potassii Bromidi* ʒj.
Sodii Bromidi ʒvj
Liquoris Arsenicalis ʒij.
Syrupi Aurantii ʒij.
Aquam Chloroformi ad ʒxx. *Misce.*

Fiat mistura. Capiat semi-unciam ter in die post cibos.

Buchu is classed as a diuretic; when administered it soon finds its way into the blood; the volatile oil, of which it contains 1½ per cent., circulates in that fluid, and on reaching the kidneys stimulates these organs in the act of being eliminated. As it comes in contact with the genito-urinary mucous membrane in *chronic cystitis* it acts upon it as an anodyne and antiseptic, altering the previously unhealthy urine, which then becomes a tonic to the relaxed membrane. It is best ad-

ministered with *pareira* and *uva ursi*. It has feeble action on the bronchial membrane in *bronchitis*.

Butyl-Chloral Hydras resembles in its action Chloral Hydrate, from which, however, it differs, in being a weaker hypnotic, in producing somewhat less cardiac depression, and in having a specific anæsthetic action upon the branches of the fifth nerve.

Liebreich believed that its action on the heart in even fairly large doses was not dangerous, and that the life of a poisoned animal could be saved by artificial respiration after the respiratory muscles had ceased acting, but its administration cannot be conducted with much less caution than that of chloral hydrate, and as an hypnotic it is of little value.

As regards its power of relieving pain, short of producing sleep, its action is weak, except in the case of *neuralgia of the fifth nerve*. Ringer finds it very valuable in nearly all neuralgic conditions of the face, occiput, neck, and in *migraine*.

In *facial neuralgia* the writer begins with 10 grs. for the first dose and 5 grs. every *two* hours for three or four more doses, and then 5 grs. 3 or 4 times daily, combined with $\frac{1}{4}$ gr. doses of extract of gelsemium. It is best given in form of pill, which can be made to contain 5 grs. of the salt if a *little* mucilage be added. It can also be given in solution in water, with glycerin. The pills should be made fresh.

Cadinum Oleum.—Oil of Cade is a local stimulant in scaly skin diseases, acting like tar. It is chiefly used in the chronic stages of inveterate *eczemas* and in *psoriasis*. It may be prescribed as an ointment mixed in all proportions with any firm cerate, or as a liquid combined with an equal amount of soft soap dissolved in alcohol (1 dr. to 1 oz.). Balzer uses the drug in the form of a bath prepared from an emulsion added to water.

Caffeine in moderately small doses (2 to 3 grs.) produces a state of mental activity, wakefulness, and restlessness, by acting as a stimulant to the brain and increasing *all* its functions. If the dose be repeated or increased, flashes of light before the eyes, noises and singing in the ears are experienced, and micturition becomes more frequent, and a state of muscular irritability supervenes, and the temperature *rises*; in still larger doses, convulsions like those produced by strychnine may be produced and mild delirium may supervene.

The vaso-motor and respiratory centres are stimulated by medicinal doses, as seen by the increased pulse rate and the rise of blood pressure. This latter result is believed to afford some explanation of its stimulating effect on the brain, since the general arterial constriction tends to cause dilatation of the cerebral vessels. It acts on the cardiac muscle, and its contractions are rendered stronger and ultimately slower, and, if previously faltering and irregular, become steady and firm by medicinal doses, while *large doses* may cause the healthy heart

to act irregularly. The increase in the heart beat is usually preceded by a transient depression. Bradford affirms that its action upon the bloodvessels of the body is definite and constant, producing constriction followed by dilatation, the constriction being mainly due to a direct action of the drug upon the muscular wall of the vessels akin to its action on the heart muscle. When injected into the frog caffeine produces a remarkable rigidity of all the muscles, as if their substance had become solidified or coagulated. It is a diuretic, often acting with *promptness*, and may be given in large doses in cardiac dropsy where digitalis fails; it probably stimulates the renal cells as well as raises the blood pressure in the kidney. In heart disease it is inferior to digitalis, but it may often be advantageously combined with it.

By its stimulating effect on the respiratory centre it is valuable as an antidote in *opium* and *alcohol poisoning*.

Caffeine in 2 to 5 gr. doses is often efficacious in *migraine* and *unilateral* headaches, in which case the effervescing caffeine citrate is a valuable and grateful preparation.

The following is the best treatment for migraine :—

R. *Caffeinæ Cit.* gr. v.

Phenazoni gr. viij. *Misce.*

Fiat pulvis. Mitte tales x. St. i. ex aq. cephalalgia urgente.

Cajuputi Oleum is a carminative and diffusible stimulant, giving better and more definite results than any of the other essential oils. In addition to its antispasmodic powers it has a slight narcotic and anodyne action, a large dose (10 mins.) diluted in an emulsion with mucilage and sugar, producing effects not unlike those following the exhibition of musk. It will be found useful in the *prostration of low fevers*, *neuralgia*, and *hysteria*.

20 min. doses of the spirit of cajuput may be given every hour in a little sherry. A full dose gives great and speedy relief in *colic*, probably stimulating the bowel by direct contact. Externally it is rubefacient, and may be applied to *painful and diseased joints* where there is much muscular spasm, and it has been used with success in *eczema*, *psoriasis*, and *acne rosacea*.

Calcium.—The lime salts act as restoratives, supplying to the blood an element found in the normal tissues; they increase the coagulability of the blood, but when administered for long periods they produce the opposite effect, and increase the retrograde metamorphosis of many constituents of the blood and tissues.

Chloride of Calcium is recommended in *tuberculosis* in 10 gr. doses, with the view of hastening calcareous degeneration in the tubercular deposits. It acts as a restorative, and has been used, but generally without effect, in *rickets* and ailments of

defective nutrition, and under its use large glandular tumours have been said to disappear. It markedly increases for a time the coagulability of the blood, and Wright has administered it in doses of 15 to 30 grs., with the view of causing coagulation of the blood in *aneurysmal sacs*. In all *remote* or *internal hæmorrhages*, and *hæmophilia* the drug is most valuable. 1 dr. may be injected into the rectum in the hæmorrhage of *typhoid fever* and of *gastric ulcer*.

Urticaria and *erythema* are often speedily relieved ; even the itching of jaundice is lessened, and *chilblains* are prevented. It has proved invaluable in a hitherto unrelievable form of constant *headache* occurring in young anæmic subjects who complain of chilblains, slight œdema of the legs, and urticaria. In these cases it acts by checking exudation.

Carbonate of Calcium and *Chalk or Creta Præparata* are valuable antacids, possessing unirritating astringent powers. They are given when we wish to reach the *intestinal surface* with an alkaline preparation of calcium. Unless the dose is very small the chalk will find its way through the duodenum, the greater part still remaining as carbonate, and passing along the intestines it will neutralise any free acid which it meets with, forming a chloride or lactate ; it thus diminishes the free secretion of the bowel, so that costive, hard, or dry motions are the result ; hence its value in the *diarrhœa* accompanied by acid, acrid evacuations, especially seen in children, generally in hot weather. It is very useful in various *stomach* derangements with acidity, but the liquor calcis is better where we want to reach the first part of the digestive tract, and it is a good rule to order these different remedies in the systematic way—*chalk* for the *intestines* and *lime water* for the *stomach*. The lime preparations being absorbed in slight degree, only minute doses of them need be ordered ; but where local antacid action is required these salts may be freely administered, though not for a very long period, as they, like magnesia, are liable to form concretions in the bowel. Externally, chalk or the precipitated carbonate is useful, on account of its mild astringent or desiccant properties, when applied to *weeping skin diseases*, especially *intertrigo* about the groins or buttocks of infants, and both are valuable antidotes in *poisoning by the mineral acids*. Duckworth recommends an ointment of equal parts chalk and benzoated lard in *erysipelas*.

Calx, Calcii Hydras, and *Liquor Calcis*.—Lime from its great avidity for water, acts when applied to moist tissues as a powerful caustic, though its eschar is very superficial. It is not often used alone, but mixed with potash and moistened before application with a little alcohol, it forms the well-known Vienna Paste used in *uterine ulcerations* and *cancerous growths*. Slaked lime (lime to which half its weight of water is added) is not used in medicine except to make lime water. When lime

water reaches the stomach it is decomposed into the chloride or lactate, and, as such, some of it finds its way into the blood. It neutralises and checks the excessive activity of the gastric juice, when administered while digestion is going on.

It thus is a valuable antacid, and the residue, if the dose be large, acts as a mild astringent upon the *intestinal mucous membrane*; and eventually, if the administration be continued, the urine becomes alkaline, and it may thus be useful in *uric acid gravel* and to dissolve *calculi*. This is the probable explanation of the value of Contrexeville water. It is best given in milk, as its taste cannot be detected in that liquid. 2 or 3 ozs., mixed with three times as much milk, often soothe the stomach in painful *dyspepsia*, *cancer*, and *gastrodynia*, and stop the vomiting in these ailments. The addition of 1 oz. to 1 pint of cow's milk prevents the formation of curdy masses, and stops *infantile vomiting* depending on this cause. Lime water makes a good injection in *leucorrhœa*, *otorrhœa*, and *gonorrhœa*.

Applied externally, lime water is a mild astringent to moist *eczema*, etc.; mixed with equal parts of olive oil it forms a rich creamy emulsion, or with linseed oil it makes the popular Carron oil, so soothing to *burns* and *scalds*, and which may be improved greatly by the addition of 1 or 2 per cent. of carbolic acid; and is useful when applied to *cracked nipples*.

The saccharated solution of lime possesses the same properties as lime water, only it is about 14 times stronger.

Calcii Phosphas is of importance as a food and constituent of the body. Its use in *rickets* and *mollities ossium* is generally futile, as in these cases the urine may be loaded with lime salts, but it is a valuable restorative in *pregnancy* and *lactation*.

Its administration has been found to hasten the *repair of fractures*, and the withdrawal of lime salts from the food of animals renders the bones soft and spongy, but phosphate of lime possesses none of the actions peculiar to free phosphorus. The premature decay of the teeth is probably owing to the absence of lime salts, caused by the perfection of modern machinery, which too effectually removes the external portion of the grain in the manufacture of flour.

In the stomach lime undergoes changes, and enters the blood as a different salt. *Anæmia* pure and simple is sometimes benefited by a course of phosphate of lime, as are also *scrofulous adenitis*, *phthisis*, and *chronic diarrhœa*.

Kolischer treats *tuberculous joints* by the injection of a solution of acid calcium phosphate.

Parrish's Syrup is an elegant and useful form in which to administer the Phosphates of Calcium and Iron.

Calcii Hypophosphis, in common with other hypophosphites, as in Fellows' Syrup, has been strongly recommended in *phthisis*. In their action they resemble phosphate of lime, and, like it, they possess none of the properties of free phosphorus,

but it is believed that under their administration the tubercular or scrofulous deposits are more prone to the calcareous degeneration. In *chronic bronchitis*, with much expectoration in young subjects, accompanied with loss of flesh and sweating, the hypophosphites will often give better results than any other remedy. Probably in these cases they act as nerve tonics to the respiratory and other centres. The syr. calcii lactophosphatis is an excellent method of administering lime salts.

Calx Chlorinata (Chlorinated lime) is valuable, not on account of the lime, but because it gives off hypochlorous acid, a powerful oxidising agent, which destroys any organic matter with which it comes in contact. This acid, being itself unstable, gives off chlorine, which splits up any remaining matter by seizing on its hydrogen, and setting oxygen free. This double action makes this substance invaluable as a deodoriser. Plates covered with chlorinated lime, and moistened with water, placed in different corners of the sick room, give off, through the agency of carbonic acid, as much chlorine as keeps down effluvia. If more rapid deodorisation is required, the room is treated in a different way: the patient having been removed, the salt is placed in a deep basin, and diluted sulphuric acid poured on it, and the room closed up for 24 hours; in this way all the chlorine is liberated, and seizes upon the hydrogen, splitting up the ammonia, sulphuretted hydrogen, etc., with which it comes in contact.

By destroying the germs which cause putrefaction it acts as an antiseptic, and it destroys odours much better than carbolic acid, which has little power in this way, though this latter is a better antiseptic.

It is used with advantage when applied in solution to parasitic skin diseases and *foul sloughing wounds, ozæna*, etc. $\frac{1}{2}$ dr. of the solution added to 1 oz. water makes a good gargle in *malignant scarlatina* or *diphtheria* with fetid ulceration. Zeuner treats *chronic ulcers* of the leg by dressing them with a 1 per cent. solution of hypochlorite of calcium under oiled silk.

Internally, this salt has been recommended in *putrid fevers*, and may be given in the form of the solution, in 20 min. doses in peppermint water.

Calx Sulphurata is administered for the sake of an action which it is believed to possess over *suppuration*. It is regarded as an Antisuppurative, aborting the process if in its early stage; and benefit has followed its use in *boils, abscesses*, and *acne*. In large doses it is an irritant poison, and even small doses often nauseate seriously. It is best given ($\frac{1}{2}$ gr.) in pills.

Calumbæ Radix is one of the most popular pure bitter tonics, and, possessing no tannin, is devoid of astringency, and may be freely given with iron. Chiretta, quassia, and gentian closely resemble calumba in their effects upon the stomach.

By the impression which they make upon the peripheral filaments of the nerves of the tongue and mouth, they increase the saliva and the gastric juice probably even before being swallowed. The gastric juice is further increased when they reach the stomach, and probably the vascularity of the organ is somewhat augmented, since these remedies in large doses cause irritation, and, when long continued, a low form of gastritis, apparently by over-stimulation. The gastric secretion being thus more freely poured out, the supply regulates the demand, and the appetite is improved. Changes of a similar nature probably occur further down the intestinal tube, and the digestion beyond the duodenum is possibly improved.

These bitters are used in *anorexia*, *dyspepsia*, and in the *debility attending convalescence from acute diseases*, where they are sometimes invaluable in stimulating the appetite and digestion. They are contra-indicated in all inflammatory states of the gastro-enteric tract. To get the full benefit of a vegetable bitter it is advisable to order its various preparations in combination.

R. *Acid. Hydrochlor. Dil.* ʒiij.
Tinct. Calumbæ ʒj.
Infus. Calumbæ ad ʒxiij. *Misce.*

Fiat mist. cujus capiat cochlearia duo ampla ter in die ante cibos ex paululo aquæ.

Cambogia is a hydragogue cathartic; when swallowed in large doses it acts as an irritant to the mucous membrane of the digestive tract, exciting the various glands to pour out increased secretion, and thus augmenting considerably the watery element in the motions, which, after a full dose, become liquid. The vermicular contractions are intensified, and the contents are swept rapidly down the canal.

Its action is severe, and the griping pains and nausea caused by it are very annoying, so that it is seldom now used alone, though it is an excellent addition to many purgative pills. In small doses it is diuretic, and the colouring matter has been said to stain the urine. The compound pill may be given in 5 gr. doses every 8 hours in *dropsies* and *obstinate constipation*. The action of gamboge is more marked on the small intestine than on the colon. After large doses severe inflammation of the alimentary tract results, and death supervenes, unless, as is nearly always the case, active vomiting expels the drug early. In poisonous doses, Orfila found that it often only produced vomiting; owing to the violence of its action on the intestines their movements became paralysed. It has no action on the liver, though the presence of bile and fat seems necessary for its absorption.

Camphora is a carminative, acting like the other volatile oils locally on the stomach and intestine. In large doses (20 grs.)

it is a diffusible stimulant, directly causing a flow of blood to the gastro-intestinal membrane, and may produce vomiting ; by stimulating the nerve centres it produces a comforting and exhilarating effect like alcohol, occasionally going the length of gay delirium and convulsions, which ultimately pass into stupor. Stockman has shown that the convulsions depend upon its stimulating effect on the cortex of the brain. The drug is excreted as campho-glycuronic acid.

The action of camphor upon the heart, blood pressure, respiration and genital functions is very variable, and reports are most contradictory. The drug not only acts as a strong carminative, but possesses antiseptic action, and it has been useful in *diarrhœa* and *cholera*. The vapour is reputed to produce marked effects upon *catarrhal affections of the respiratory membrane*, and 5 grs. added to each dose of expectorant mixture are useful in the *chronic bronchitis* of the aged, and 5 gr. doses, repeated every six hours, benefit *hysteria*, *dysmenorrhœa*, and other *spasmodic affections*. It is still, with some practitioners of the old school, a favourite stimulant to the heart in low fevers, and it is believed to control delirium and reduce temperature. It has marked antigalactagogue action, and should be applied to the breasts at the same time that it is given in 3 gr. doses.

Externally, it is a stimulating application, used in *chilblains*, and its mild rubefacient properties render it a popular ingredient in most liniments for *rheumatic troubles*. The ammoniated camphor liniment is a powerful counter-irritant, and may be made to cause vesication. $\frac{1}{2}$ dr. camphor to 1 oz. of zinc ointment allays the itching of *eczema* about the genitals.

Milk dissolves camphor readily, 1 oz. taking up nearly 1 dr. of it, and it is the best method of administering the remedy, especially in *low fevers*, where a teaspoonful of the milky solution may be given every three hours.

Rubini's solution consists of a solution of 1 oz. camphor in 1 oz. (by weight) absolute alcohol. Dose—3 to 8 mins.

Cannabis Indica may be regarded as a true narcotic, like alcohol or opium, producing first a period of excitement, or intoxication, followed afterwards by sleep and coma. Its exciting stage, however, is better marked than that of these remedies, and is much *longer* than that of opium. It is freely indulged in in the East under the names of Bhang, Hashish, etc. The intoxication, often lasting a couple of hours, is characterised by delirium of a pleasant or boisterous kind, with surprising mental confusion and distorted ideas of the duration of time, of the patient's individuality and position, alternating with fits of prostration bordering on catalepsy, and followed eventually by sleep, in which pleasant or mirthful dreams generally run riot. The stomach is not affected, and

the appetite may be increased. It is a powerful aphrodisiac, probably acting through its cerebral effects, causing voluptuous dreams and illusions. Binz describes the dominant sensation experienced when smoking Indian hemp as a pleasing indifference to all external impressions, a sort of *bien-être*, the imaginative Oriental enjoying the bliss of paradise, and the sober Teuton passing into the land of dreams and visions. Marshall believes that the continuous use of the drug produces a chronic state of intoxication, which often ends in insanity, and he maintains that the action upon the cerebral centres is a *depressing* one from the first. There is no drug whose action is more influenced by individual susceptibility, race, age, habits, etc.

The sensibility is diminished, cutaneous anæsthesia and blunting of the muscular sense being observed. The pupil is dilated, constipation does not follow, and sweating is never great; hence its use as an anodyne in *neuralgia*, in *migraine*, and in *exophthalmic goitre*; an hypnotic in *sleeplessness*, *delirium tremens*, and especially in *mania*; an *antispasmodic* in *chorea*, *epilepsy*, *eclampsia*, *asthma*, *hepatic* and *renal colic*, etc. It is far less reliable as an hypnotic and analgesic than opium. The region in which the plant is grown, the time of collection, temperature, soil, and other conditions, produce great variations in its action, and threaten to lead to its complete disuse in this country.

Stephen Mackenzie found that full doses, morning and night, relieve dull *continuous headache* when other remedies fail. The writer has obtained best results in chronic or continuous migrainous headaches with the following:—

R. *Ext. Cannab. Ind.* gr. $\frac{1}{3}$.
Butyl-Chloral Hyd. gr. iv. *Misce.*

Ft. pil. Mitte tales xxiv. St. i. ter in die.

It is stated to act as a hæmostatic on the uterus in *menorrhagia*, and it allays ovarian irritation. It has been reported as useful in *tetanus*, and *hæmaturia* has disappeared after its administration, and sometimes it acts as a diuretic.

10 to 20 mins. of the tincture should be given in sherry, or in a teaspoonful of brandy, on account of its decomposition, when added to water; but 1 oz. of mucilage emulsifies 1 dr. of tincture. The *fresh* extract made into a pill will be found the most reliable form, in doses of $\frac{1}{2}$ to 1 gr.

In the section on Non-Official Remedies the reader will see noticed a preparation under Cannabin Tannas and Cannabinol.

Cantharides is chiefly employed for its external effects, though when administered internally it produces definite results, acting as a stimulant to the stomach and genito-urinary organs, causing in over-doses frequent, painful, bloody micturi-

tion, with priapism, bloody, painful stools, salivation, and symptoms of violent irritant poisoning, followed by convulsions, delirium, and asphyxia. Even when the drug has been absorbed by the skin severe ulceration of the stomach and intestines has been found after death.

In small doses it is diuretic, aphrodisiac, and emmenagogue. The cantharides is absorbed, and circulating in the blood, reaches the urinary organs, which it irritates as it is being eliminated. The effect of cantharides upon the kidneys begins as a genuine inflammation within the glomeruli, which gradually spreads among the cells of the tubules until all the tubes become affected, producing albuminuria and hæmaturia. The mouth, stomach, and intestines are affected by direct contact with it after being swallowed, and its action on the genital organs and uterus is generally explained by the sympathy that exists between these parts and the urinary tract.

It has been advocated in various *kidney diseases*, after the acute stage, as a diuretic, and in *bladder* cases which are characterised by want of power in the sphincter, especially in women. Its administration in these cases may be followed by serious aggravation of the condition, and as an emmenagogue and aphrodisiac it should seldom be resorted to. 1 to 3 mins. of the tincture will be found enough for an ordinary dose, freely diluted with barley water.

Liebreich advocated Cantharidinate of Potash as a remedy for *tuberculosis* in hypodermic doses of $\frac{1}{1300}$ to $\frac{1}{324}$ gr. He claimed for it that it caused the exudation of serum from the capillaries round the tubercular nodules, which ultimately destroyed the growth, but the treatment even in the case of lupus and laryngeal tubercle is now practically abandoned.

Externally, cantharides is used diluted in various ways as a rubefacient, as in *stimulating applications to the scalp*, where the object is to keep up a constant excessive supply of blood for the nourishment of the hair bulbs, but it is for producing vesication that the Spanish fly maintains its importance in medicine. It acts by causing a rapid local inflammation of the skin, beginning with tingling pain, heat, redness, and eventually swelling; serum appears in from 4 to 12 hours.

The peripheral extremities of the nerves supplying the skin of the affected part conduct the stimulus of the blister to centres from which it may be radiated, transferred, or reflected to centrifugal or trophic nerves, which may affect various changes in the areas to which they are supplied.

In this, the most probable explanation, it is easy to see (1) the effect which blisters may produce upon distant parts; (2) they also affect parts in the immediate neighbourhood by extracting the blood from them, though this must be to a small extent; (3) they may affect neighbouring parts by direct

spread of the irritation originally produced, as the peritoneum and pleura have been seen inflamed from the application of a blister to the abdomen or chest ; and the writer believes that he has seen pericarditis produced in this way in thin subjects. Brunton points out that the skin and tissues immediately underneath the blister are congested, whilst the deeper layers of tissue have their vessels contracted. Through thick parietes a blister would not be likely to cause congestion of the pleura.

When *absorption* is the result desired, Brunton advises that the blister should be applied directly over the part, but if reduction of congestion or inflammation is aimed at it should be applied at a little distance, as in pericarditis it might, if applied directly over the inflamed sac, increase the mischief.

Robin has recently shown that blisters promote phagocytosis, and cause so much extra air to pass through the lungs that the absorbed oxygen may be doubled.

In *neuralgia*, blisters applied over the seat of pain intensify the suffering ; they should be applied close to the spine—over the posterior branch of the spinal nerve trunk—from which the painful nerves issue ; *sciatica* is often benefited by a small blister placed over the course of the nerve.

Various *eye inflammations* are modified or checked by counter-irritation behind the ear, and though the usefulness of blisters is doubted in *acute pleuritis* and *pneumonia*, there can be little question of their value in causing the absorption of long-standing pleural effusions, in which cases great good is derived from *flying blisters*—that is, a series of very small blisters (each not larger than a crown) kept on for a short time, say two hours. Indeed, it may be laid down as a rule that any benefit to be had from a blister is obtained during the first four or five hours of its application, all of which time it keeps up a stimulating effect upon the general system ; after this, much depression often results, which cannot be accounted for, as some suppose, by the mere loss of serum ; if vesication does not occur in this time a poultice generally determines it. In applying flying blisters in *pleuritis* or *sciatica* a small blister may be applied for one or two hours, then removed and applied a few inches farther away, where it may be left for two or three hours, after which time the same blister may be applied for three or four hours to another spot a few inches farther from the site of the second one.

In *acute rheumatism*, blisters to the affected joints have been long advocated ; but Harkin has pointed out surprising results obtained by a large blister over the heart, early in the disease, and the writer has seen it reduce temperature and pain in a most decided way. Graves recommended blisters in various *feverish states* with much *prostration* ; counter-irritation over the nape of the neck controls many forms of *headache*.

Harkin obtained good results in *diarrhœa* and *cholera* by blistering the skin over the course of the vagus in the neck. Petit and M. Verneuil have corroborated his views about the successful treatment of hæmorrhages, like epistaxis and rebellious bleeding from piles, etc., by revulsion over the liver region.

Head has shown that in diseased conditions of certain organs there is a tender point to be found constantly in some skin area, and these areas in the main correspond to the regions where blistering has in the old empiric way been found useful in diseased states of the liver, stomach, pleura, etc.

For all purposes the emplastrum cantharidis is the most manageable preparation—the liquid or collodion acts much more quickly. Unless the bleb is large it may be let alone, the blistered surface being covered with greased lint or cotton wool. Sometimes cantharides affects the urinary organs after a blister, by being absorbed through the skin ; free diluent drinks, with a few grains of camphor internally, and a morphine suppository, generally remedy this.

Blisters should not be applied or kept long on the old or infirm, or on paralysed parts, or over bony prominences, or on the very young, or in acute kidney diseases.

Caoutchouc is introduced into the B.P. for its physical properties in making a protective covering like the old gutta-percha solution or Traumaticine, which acted like collodion in some *skin diseases*.

Capsicum possesses powerful local action ; when taken into the mouth, it increases the secretion of the salivary glands ; when swallowed it acts as a stimulant to the mucous membrane of the stomach, and increases its secretion, its internal local action being probably like its external rubefacient effect, so that it might be called an internal rubefacient. In repeated doses it produces a slight narcotic effect, and it increases the functional activity of the genital organs. In large doses it causes gastro-intestinal irritation or inflammation. It may act as a diuretic.

The stomachic effects of cayenne are seen in its free use as a condiment and appetiser in warm climates, and it is useful in *dyspepsia*, and invaluable as a tonic in *dipsomania*, in which 10 to 20 mins. of the tincture may be given every two hours before meals. In *delirium tremens* large doses (30 grs.) sometimes produce sleep. Locally it is useful in the form of a gargle for *relaxed throats*. 1 dr. tincture with 1 dr. tannin, and 10 ozs. acid infusion of roses, make a splendid gargle. Concentrated preparations will redden the skin almost to vesication, but with much pain and burning, and are said to remove the discoloration of *bruises* ; a paste composed of capsicum, and known as "Chili paste," is used as a popular rubefacient, its

official representative is the Ungt. Capsici. Buck obtains rapid relief from *lumbago*, *acute torticollis*, and *muscular rheumatism* by applying an infusion on lint covered in under oiled silk.

R. *Tr. Capsici* ʒiij.
Spt. Ammon. Aromat. ʒj.
Tr. Cinchonæ ʒj.
Tr. Card. Co. ʒvj.
Aquam ad ʒviiij. *Misce.*

Fiat mistura. *Signa*—"A tablespoonful with the same quantity of water every two hours, or when the craving for drink comes on."

Carbo Ligni is a powerful oxidising agent, owing to the amount of oxygen absorbed by it, and it is used as an antidote in poisoning by phosphorus and by the alkaloids morphine, strychnine, etc., rendering their action harmless— $\frac{1}{2}$ oz. neutralising 1 gr.—but its administration should not interfere with the use of the stomach-pump, emetics, and purgatives, which should follow.

Internally, wood charcoal is administered in *flatulent conditions of the stomach and intestines* as an absorbent and deodoriser; it occasionally checks vomiting and the formation of gas, and stops fermentation and purges mildly. Jenner used charcoal in 1 dr. doses as an enteric disinfectant in *typhoid*, but it is possible that it might cause irritation of the ulcers in the bowel. The writer always orders the freshly-dried charcoal to be swallowed wrapped up in wafer paper, but even when mixed with water charcoal possesses considerable oxidising power.

Externally, charcoal acts as a powerful deodoriser, and, as such, may be freely applied to *putrid sores* and *gangrenous limbs*, or it may be spread on plates to sweeten the air of the sick room. These properties depend upon its power of absorbing and condensing in its pores gases like oxygen, which destroy the gaseous products of putrefaction by coming into direct contact with them. A charcoal poultice is an excellent application to *foul ulcers*.

The action of charcoal has been studied by Wilde, who concludes that, though incapable of destroying living organisms, it acts by oxidising the chemical substances formed during abnormal decomposition, or the toxins produced by pathogenic organisms, converting "the anaërobic process of putrefaction into an aërobic one, and so leading to the formation of inoffensive simple chemical compounds in place of offensive and toxic intermediate substances."

Carbon. Bisulphidum is only used as a solvent for india-rubber and phosphorus.

In solution of the strength of 4 mins. in 1 pint of water it is

a powerful antiseptic, destroying all bacterial life. It has been used as a dressing to *foul sores*, and as a spray in *diphtheria*, and as an inhalation in *cholera* and *typhoid fever* when given internally at the same time. When the vapour is inhaled it produces *anæsthesia*, like chloroform, only the insensibility is shorter. The spray produces local anæsthesia like ether. Its disgusting odour is a serious drawback to its use, and, moreover, it is a powerful poison.

Cardamomum acts as a warm stomachic and carminative, like ginger, increasing the gastric secretion and improving the appetite. Its local stimulating influence increases by reflex action the peristaltic movements of the intestines, and thus flatus is expelled. It makes a good corrective addition to purgative medicines, and, as the compound tincture is of a bright red colour, compatible with most drugs (iron excepted), it is a prized flavouring and colouring ingredient, and medicine containing it has a better chance of remaining in an irritable stomach than if given alone.

Carui Fructus.—Its action is explained under *Anethum*, with which it is practically identical.

Caryophyllum.—Cloves, when administered, act as a stomachic. This remedy resembles the previous two in its tonic, carminative, and stimulating effects. The essential oil is powerfully antiseptic; when applied to the terminal filaments of a painful and irritated nerve it acts as a local analgesic; hence its use in *toothache* and in some cases of *superficial neuralgia*. Five drops on a little sugar speedily remove pain caused by accumulations of air in the bowel, by exciting reflex muscular contractions, driving the air forwards or backwards, relieving over-distention, and acting as a local anodyne to the irritated nerves of the part. Brunton and Carl have shown that carminatives, like cloves, do not cause absorption of the gases in the bowel; they found that oil of cloves markedly increased the secretion of the intestine.

A weak aqueous extract of cloves has been successfully employed locally for the cure of corneal opacities.

Cascara Sagrada is a valuable slowly acting cathartic; in moderate doses ($\frac{1}{2}$ dr. liquid extract) it acts as a stimulant to the entire glandular apparatus of the alimentary canal, increasing slightly the *secretion* and markedly the *peristaltic action* of the intestine by stimulating the muscular fibres, and producing healthy copious evacuations. Smaller doses (5 to 10 minims) have a decidedly tonic effect upon the stomach, like the vegetable bitters, increasing the appetite and mildly stimulating the liver. Cascara is the best remedy for *chronic constipation*, and the dose can be so graduated that painless, soft natural motions are voided daily where constipation has

been the rule for years. The dose can be gradually *diminished* while the good effects remain, and generally even in aggravated cases no augmentation of the dose is necessary. The liquid extract may be given in doses of $\frac{1}{2}$ to 1 dr. every evening. The main element in the successful treatment of constipation by cascara is to insist upon the patient so graduating the dose himself and arranging the time of its operation as to produce one morning motion *without purgation*, and this must be kept up for at least two months. The solid extract may be likewise employed in pills alone or with aloes. After a time the dose can be gradually lessened and the drug entirely withdrawn.

R. *Extracti Cascaræ S. Liquidi* ʒii.
Tr. Nucis Vomice ʒiii.
Glycerinum ad ʒiv. *Misce.*

Fiat mistura, cujus capiat ʒi. *mane nocteque ad quatuor vicem deinde omni nocte.*

Cascarilla is an agreeable tonic, acting like Calumba, only it possesses decided aromatic qualities. It has feeble febrifuge properties, like cinchona, and the volatile principle which it contains may possibly act upon the respiratory mucous membrane. It is useful in *dyspepsia*, where a stimulating tonic is indicated, and when smoked in a pipe it is valuable as a *substitute for tobacco* when we wish to wean heavy smokers from their vice. Professor W. G. Smith gives the following in convalescence from fevers :—

R. *Acid. Nit.-Mur. Dil.* ʒij.
Tinct. Cinch. Co. ʒj.
Infus. Cascarillæ ad ʒviiij. *Misce.*
Capiat ʒss. *vel* ʒi. *ter in die.*

Cassiæ Pulpa.—This preparation is very seldom used in medicine except as an ingredient in senna confection. It is a mild laxative, like manna, and it probably acts by stimulating the peristaltic movements of the intestines.

Catechu is a valuable astringent, acting exactly like tannic acid (which see). It is given in *passive diarrhæas*, but is of no use in *remote hæmorrhages*, and is well suited for the treatment of diarrhœa in children.

FOR DIARRHŒA IN A CHILD ONE YEAR OLD.

R. *Tinct. Catechu* ʒiij.
Spt. Chloroformi ʒj.
Spt. Anisi ʒj.
Mist. Cretæ ad ʒiv. *Misce.*

Fiat mist. cujus capiat coch. i. min. post singulas dejectiones liquidas.

Cera Alba, Cera Flava, and **Cetaceum** are seldom employed internally. When swallowed they act as protectives or demulcents, by covering over the gastro-intestinal surface from irritating secretions, and externally they are largely employed as emollients. Possessing bland, unirritating qualities, they are valuable in making the groundwork or basis of more active ointments or cerates. **Spermaceti** formerly was much employed as an expectorant, but it most probably is devoid of such virtue. It may be given beaten up with egg and warm milk.

Cerii Oxalas is a gastric sedative, acting probably locally like bismuth in doses of 5 to 10 grs. There is no evidence that any portion of the ordinary medicinal dose is ever absorbed. It was introduced as a remedy for the *vomiting of pregnancy*, but it is falling into disrepute, and should be omitted from the B.P.

Chirata is a pure bitter tonic, exciting very gently the secretion of the gastric juice, like calumba, gentian, and quassia, aiding digestion and improving the appetite. Its effects are best seen in the *atonic state of the stomach of drunkards* after a prolonged course of drinking, and it may be combined with bismuth or a mineral acid, the former if *nausea or vomiting*, the latter if a *furred* state of the tongue exist.

Chloral Hydras produces sleep identical in every respect with sound, natural, refreshing slumber, lasting 5, 6, or 8 hours, usually devoid of dreams, and free from stupor and narcotism, and not followed by gastric or other trouble. It does *not* act, as Liebreich—its introducer—supposed, by being decomposed in the blood into chloroform on meeting the alkali of the circulating fluid, since this is too weak to decompose it, and the odour of chloral and not of chloroform is perceived from the breath; and chloroform is not found in the blood.

The drug appears in the urine, and if this secretion be alkaline it may change the chloral into chloroform. Uro-chloralic acid also is found in the urine.

In safe doses it does not markedly relieve pain, nor influence the nerves of sensation; hence if severe pain be present, chloral, unlike opium, will not relieve it, unless in doses just short of affecting reflex action, and if the pain continue, probably no sleep will supervene. Reflex action is weakened and destroyed by large doses, the blood pressure falls from the vascular dilatation caused by paralysis of the vaso-motor centre and the cardiac ganglia; the pulse and respiration are slowed; and if a still larger quantity is administered, loss of sensation and deep coma occur. The drug profoundly depresses the entire central nervous system. Death results from paralysis of the respiratory centre, the heart soon

ceasing to beat from the paralysis caused by its action on the muscular tissue and ganglia. The motor nerves or muscles are not directly affected, but the pupil is *contracted*. The *temperature falls markedly*, and Brunton found that this fall was so great as to alone cause death. The temperature falls from $1\frac{1}{2}^{\circ}$ to $1\frac{1}{2}^{\circ}$ F. after ordinary hypnotic doses, and a fall of 10° may follow a poisonous dose.

Chloral is used as an hypnotic in *sleeplessness, caused by over-work or worry*, but *delirium tremens* is the affection in which its virtues have been most prized, given in 20 to 30 gr. doses. After the delirium has lasted several days, the writer believes chloral to be a dangerous remedy, which must be used with great caution, if employed at all, the heart at this time being especially susceptible to its action. He believes that the use of chloral raises the mortality in this disease. In the administration of chloral as an hypnotic, it is more than probable that it is answerable for more deaths than all the other hypnotics together, and as an hypnotic in delirium tremens the writer has ceased to use it.

It is powerfully antispasmodic, and has been used with benefit in *infantile* and *puerperal convulsions*, *chorea*, *asthma*, *sea-sickness*, and *acute mania*; and it is highly beneficial, and occasionally curative, in *tetanus*. Excellent results are obtained in *whooping-cough*—a child 2 years old may get 1 to 2 grs. every 3 hours. It relieves the early *pains of labour*, without directly hindering the uterine contractions.

Chloral should be given with great caution to patients with fatty hearts or atheromatous vessels, and its prolonged administration will cause the healthy cardiac muscle to rapidly become fatty. Its hypnotic effects come on in a very short time (less than 30 minutes), and pass off as rapidly; it should, therefore, be repeated inside an hour or two if the result is not produced, and the patient should always be in bed before swallowing the first dose. Externally, it is a good antiseptic, and a lotion of 8 grs. to 1 oz. is a painless stimulant to *unhealthy ulcers*, and often cures *eczema*.

Powdered chloral sprinkled over adhesive plaster, gently warmed and laid on the skin, makes a painless, speedy, and effective blister, superior to cantharides (Fauntleroy).

Chloral Camphor is a liquid consisting of equal quantities of chloral and camphor rubbed together; it dissolves morphia and other alkaloids, and is an elegant application in superficial *neuralgias*. Chloral Menthol is prepared in the same way.

Chloral is used as an antidote to strychnine and Calabar bean. In addition to its treacherous action upon the heart, chloral is very liable to induce a chloral habit upon those who use it often, and as the victim goes on increasing the dose so as to induce sleep, without any warning he may take a dose which stops his respiration or heart. (See under Poisoning.)

Chlorine, when inspired, acts as a powerful irritant, causing death from spasm of the glottis or inflammation of the air passages; greatly diluted with air it is a stimulating expectorant.

Externally applied it is a rubefacient, but it is only used in medicine for its powerful deodorising properties. (See *Calx Chlorinata*.) Internally, a solution of chlorine has been recommended in *fevers* as a germ destroyer, but in doses sufficient for this purpose it would destroy life. Yeo's Chlorine treatment of *typhoid fever* has not proved satisfactory in the writer's hands. The mixture is made by shaking up 30 grs. chlorate of potash with 1 dr. strong hydrochloric acid in a 12-oz. bottle, and adding water gradually with continual shaking of the corked bottle; 24 to 36 grs. of quinine are then added, and 1 oz. given every 1 to 4 hours. (See also *Euchlorine*.)

Chloroform is used in medicine as an inhalation to produce general insensibility, and is swallowed or applied externally as a remedy for various complaints. The vapour, when inhaled, gives rise at first to symptoms often differing widely in different individuals, and depending upon some peculiarity of the patient. The action resembles that of alcohol, inasmuch as the higher cerebral centres are at first stimulated and afterwards paralysed. Cushny describes the action as a descending depression and paralysis of the central nervous system affecting the medullary centres last of all, the sensory and receptive functions being sooner affected than the motor, the preliminary exciting action being, as in the case of alcohol, doubtful.

The "Preliminary Stage" begins with some cough or suffocative feeling, stimulation of the cerebral convolutions and higher centres, exhilaration of spirits, sounds in the head, mental confusion, with congestion of the eyes and face, and symptoms resembling mild alcoholic intoxication. The sensibility is blunted.

Often there now succeeds what has been known as the "Struggling Stage," with marked mental or motor excitement and intoxication, acceleration of the pulse (from excitement), lividity of the face, greatly diminished sensibility, and dilatation of the pupils:

Rapidly passing into

The "Anæsthetic Stage," or state of complete narcosis, characterised by *depression* of the nerve centres which were previously *stimulated*; there now rapidly ensue total insensibility and muscular relaxation, with suspension of the cerebral functions, and more or less paralysis of the lower or organic life centres, loss of reflex action, diminution in the force and frequency of the pulse, and contracted pupils.

The operator recognises this stage by holding up a limb and it falls perfectly flaccid; by touching the cornea, when no

attempt at winking occurs ; by exposing the iris suddenly to light after having the lids closed, and no further contraction follows ; by pinching strongly the skin of a sensitive place, and not the slightest wincing is noticed.

If the inhalation is pushed further, death may occur. (1) The *respiration* is interfered with, so that death occurs through apnœa from the stoppage of the breathing, through paralysis of the respiratory centre, or on account of the tongue falling back, or vomited matter getting into the trachea. (2) By the *heart* becoming *directly* paralysed, through the influence of the chloroform on the cardiac ganglia ; and this may happen at any stage, and without warning. (3) Both respiration and heart may suddenly fail at any stage. Much controversy has taken place over the manner in which the drug kills—*i.e.*, whether the death is caused by cardiac or respiratory failure, and the question cannot be said to be settled, as very often heart and respiration seem to stop almost at the same time, and some authorities maintain that the respiratory centre fails because of the small supply of blood pumped to it by the failing heart.

The most important points in the induction of chloroform anæsthesia are (1) to ensure that the vapour of the drug is always freely diluted with air, never more than 1 part of vapour in 25 of air being permitted ; (2) to so conduct the administration that the most efficient breathing is maintained throughout ; and (3) to keep up a uniform degree or depth of narcosis.

Respiration must be carefully watched and its irregularity or failure met by the instant removal of the inhaler ; and if there be asphyxia, the chin should be forcibly drawn away from the sternum, or the tongue drawn forward, or artificial respiration, which is the best remedy to rely upon, may be performed ; the cold douche may be used at the same time. Oxygen inhalation is valuable when severe dyspnœa shows itself. When the heart stops, the patient's head should be placed lower than his body, artificial respiration should be kept up, and ammonia inhalation, and galvanism may be tried. Hypodermic injection of ammonia or strychnine may be suddenly demanded during this crisis. The pupil gives important indications ; as long as it remains contracted there is, as a rule, little danger. The first sign of vomiting often is a slight dilatation. If the drug is now pushed this may pass off, but full dilatation of the pupil always means grave danger.

Brunton believes that death may be often the result of *shock*, and may be caused by too little instead of too much chloroform. He explains how death has so often followed the performance of trivial operations where deep narcosis is generally considered unnecessary. When no chloroform is

administered, the stimulus to the sensory nerves produced by an operation causes reflex contraction of the vessels and raised blood pressure which overcomes the depressing effect at the same time always produced upon the heart by reflex action, and all goes well ; but when partial anæsthesia has been produced, reflex contraction of the vessels may be lost whilst the depressing reflex effect of the operation upon the heart may still remain, death from the shock of the operation following. When the narcosis is *deep*, both the reflex depression upon the heart and the reflex contraction of the vessels are absent, and the stimulus of cutting sensory nerves does not affect the heart one way or other. The operation should, therefore, never be commenced till full narcosis has been produced.

Various inhalers are used. Junker's, which prevents the vapour reaching the lung in a more concentrated form than about 4 per cent., is the best ; but the open sponge or towel, with the chloroform slowly and continuously dropped on it, answers every purpose, and 1 dr. will be enough to begin with. The skilful anæsthetist can regulate the concentration of the vapour by holding the towel close to the face when the respiration is shallow and removing it some distance when the patient begins to breathe very deeply. No food should be allowed for five hours previously, but the plan of starving for a longer period than this is to be condemned, as it leaves patients in a bad condition to resist the effects of hæmorrhage or shock, especially those with vigorous digestive powers, who are accustomed to the stimulus of food every four or five hours.

Chloroform should always be administered with great caution, and if there be fatty or other disease of the heart the caution should, if possible, be increased. There is hardly any state of the system in which the drug may not be used, and it may be administered at all ages, children, as a rule, bearing it well. The vomiting so often following its use may be to a great extent prevented by a previous hypodermic injection of morphine to which a little atropine has been added, or it may be relieved by inhaling the vapour of vinegar.

The report of the Hyderabad Commission is strongly in favour of chloroform as against ether, but this decision has been rejected by most authorities. It states " that safety is ensured by simply keeping the breathing absolutely regular all through the inhalation, and to watch the pulse is both wrong and dangerous." The study of large numbers of cases proves that chloroform is about four times more deadly than ether. 1 in 3,000 inhalations represents the death rate in chloroform, whilst about 1 in 12,000 represents the mortality in ether inhalation. As described under Ether, it is often a good plan to start the anæsthesia by that drug, and then maintain it by chloroform.

With many, the A.C.E. mixture is a favourite agent for producing anæsthesia ; it consists of 1 part of absolute alcohol, 2 parts of chloroform, and 3 of ether (S.G. 720). Schleich recommends the admixture of chloroform and ether with petroleum ether or benzine.

Chloroform anæsthesia is employed for surgical operations, *puerperal* and *uræmic convulsions*, during the colic of *gallstones* and *renal calculi*, and largely in *obstetric practice*, in which it is most decidedly freer from danger than in any other class of cases, and the third stage of its action should never be experienced in labour unless where a difficult instrumental delivery is about to take place. The patient can be kept just upon the border of dreamland, without producing insensibility. In a host of spasmodic ailments, as *laryngismus*, *pertussis*, and *asthma*, the vapour of chloroform is highly beneficial, and it is of great benefit to the physician in carrying out the *diagnosis of phantom and uterine tumours*, and to the surgeon in *reducing dislocations*.

Internally, chloroform in small doses acts as a gastric stimulant, rapidly followed by sedative effects, probably by affecting the peripheral nerves in the same way as a pure narcotic affects the great centres. It acts in this way when given in 1 min. doses, properly diluted, and relieves *gastralgia*, *vomiting*, *sea-sickness*, and *reflex headache*. From 10 to 20 mins. affect the system, causing, after absorption, marked narcotic effects, and, if repeated, symptoms resembling those following its inhalation ; administered in large quantities, undiluted, it acts as an irritant poison. From its effects upon the centres of sensation it is useful as an anodyne, relieving pain, inducing sleep, and preventing spasm, and its influence is intensified when opium is combined with it, as for the relief of cough and hiccough. Large doses kill *tape-worm*. The action of the drug upon the nerve centres and heart is to be explained by the fact of its being a general protoplasmic poison which does not markedly alter the blood, but being carried by the red corpuscles to the sensitive protoplasm, it there exerts its depressing or paralysing influence.

Externally, chloroform applied on lint to the skin and quickly covered with oiled silk acts as an irritant, occasionally producing vesication. If uncovered or if diluted before being applied, it acts as a local anæsthetic by its influence over the endings of the sensory nerves, and hence it is useful in *neuralgia*, *odontalgia*, and *urticaria*.

Waller showed that it greatly assists the absorption of alkaloids through the skin, the chloroform rapidly penetrating and carrying with it the dissolved substance.

Bartholow injected 10 mins. or more of chloroform through the hypodermic needle thrust deeply into the tissues surrounding the affected nerve for the relief of *neuralgia*.

Chrysarobin is a powerful irritant and a destroyer of vegetable micro-organisms. Its chief use is in *psoriasis*, though it remains to be proven that any micro-organism is the cause of this disease. An ointment (of from $\frac{1}{3}$ to 1 dr. mixed *intimately* with 1 oz. of heated lard or vaseline) rubbed twice daily into the scaly patches rapidly causes their disappearance. It frequently produces a painful erythematous inflammation and purple staining of the surrounding healthy skin, which prevents its use in some patients. The writer, after considerable experience of chrysarobin, is satisfied that this need never occur if the application be confined exclusively to the diseased islands *and not permitted to touch the healthy skin*. This little point he believes to be the secret of the success of the treatment. Dr. Fox has advised application of chrysarobin made into a paste with water, smeared over the spots, and covered with collodion. Traumaticine will be found even more satisfactory. Brooke's salve sticks are better still. The writer, however, finds that the best of all ways is to cover the patch with a strong stiff ointment or paste of the drug, and place upon the top of it a larger piece of rubber plaster.

It acts both locally and constitutionally. Its local action may be seen by rubbing the ointment into the diseased spots on one side of the body of a patient affected with psoriasis. In a week or ten days the skin on the side so treated shows decided signs of improvement not in the least apparent on the opposite, and as the diseased patches begin to disappear under the direct application of the remedy, those regions to which it has not been applied eventually begin to show signs of improvement also; and the writer found, by persistently continuing the application to the spots originally so treated, the entire surface of the body cleared up. This is probably caused by its absorption into the system and its conveyance to all the diseased areas. The drug is found in the urine. The application cannot be too long continued, because an ointment which causes no irritation whatever for a few weeks, so long as the spot to which it is applied remains scaly and diseased, soon acts as a powerful irritant to the same spot as it becomes resolved and healthy.

Success has followed the internal use of chrysarobin in *psoriasis*, *eczema*, *acne*, etc., but it often produces violent griping, purging, vomiting, anorexia, and malaise sometimes after doses as small as $\frac{1}{8}$ gr. in a pill. Chrysarobin is a powerful parasiticide, and has proved efficacious in *ringworm*, *tinea*, etc. (30 grs. to 1 oz.).

The deep purplish discolorations which it produces on the skin and bed linen are barriers to its use, and great care must be exercised in applying the ointment to the face, as it causes œdema of the eyelids, with discoloration, though it can be applied to the scalp (15 grs. to 1 oz.) with benefit. The dis-

coloration can be partially removed by weak vegetable acids or solution of chlorine.

Cimicifuga is occasionally employed as a remedy in *acute* and *chronic rheumatism*; more frequently in *muscular rheumatism*, *lumbago*, *sciatica*, etc.; it also has been used as a stimulating *expectorant* and in *chorea*. The drug in this country has fallen into disrepute. Large doses cause vomiting, vertigo, tremors, exudation from the bronchial mucous membrane, and a marked *diminution in the frequency of the pulse*. Small doses act like the bitter tonics, and are credited with cardiac tonic powers, while large doses powerfully depress the heart, like aconite.

It acts on the uterus, like ergot, and $\frac{1}{2}$ dr. doses of the tincture every two hours are recommended in *congestive dysmenorrhœa* and *retained placenta*. The accounts of its pharmacological action and therapeutic effects are so vague and contradictory that its rejection from the B.P. would cause no regret.

Cinchona.—Cinchona differs from its alkaloid, quinine, in being more astringent, about 50 times more bulky, more apt to irritate the stomach, and more difficult of absorption. Quinine possesses great power as a destroyer of the life of minute organisms. Less than 1 gr. dissolved in 1 oz. of water will cause the instant death of active infusoria and fungi, and double this strength prevents or checks the alcoholic fermentation and destroys putrefactive decomposition. Binz found that 1 in 20,000 (1 gr. in 46 ozs.) killed the paramecia in hay infusions in two hours, and he states that this lethal action on the lowest forms of life is peculiar to quinine. The writer has found its action over the infusoria in hay infusions to be at least 50 times more potent than strychnine. 1 gr. in 4 ozs. will destroy the white corpuscles of fresh human blood, and will also prevent diapedesis in the frog's mesentery. It has little or no action on the red cells.

Single large doses of quinine, or moderate doses of 2 to 5 grs., frequently repeated, give rise to a group of unpleasant symptoms, called "cinchonism"—viz., ringing noises in the ears, or deafness more or less complete, partial blindness, headache, and delirium, with nausea and insomnia. These effects are produced by the direct action of quinine upon the nerve cells. Large doses frequently repeated cause an intensification of all these symptoms, with giddiness, dilated pupils, embarrassed respiration, convulsions, paralysis, stupor, and collapse. There is diminution of blood pressure from weakness of the heart muscle and paralysis of the vaso-motor centre; through its use tissue change and oxidation are distinctly lessened, and the urea and waste products are diminished, and the respiratory centre becomes paralysed. A very few patients show marked

susceptibility, amounting to true idiosyncrasy. Though quinine must be regarded as a protoplasmic poison, enormous doses have been taken without injury, and very few deaths can be clearly attributed to its use. Occasionally skin eruptions follow its administration.

In febrile conditions large doses are tolerated without causing unpleasant effects. The sulphate of quinine is often administered in fevers in 40 gr. doses, and as much as 1 oz. has been taken by mistake without any serious results.

In small doses, quinine may be taken as the type of a gastric or bitter tonic, increasing at first the activity of the process of secretion in the stomach, but after a time checking it; and if continued too long, or if the dose be increased, the digestion and appetite become somewhat impaired, and an irritable condition of the gastric mucous membrane results.

Small doses have *no* effect on the pulse; moderately large doses (10 to 20 grs.) increase the number of pulsations, whilst slightly diminishing their power; and very large doses (40 to 80 grs.) cause cardiac depression, with fall in the number of pulsations and in the tension.

In health, quinine appears (short of serious doses) to possess no influence over the body heat. In disease, however, full doses of the drug, especially in children, cause a steady diminution in the temperature when this is considerably above the normal standard, though great difficulty exists in demonstrating how the drug produces the fall.

Thus quinine ranks as an antipyretic; it is still the best and safest of all the antipyretics, and various ideas prevail as to how it acts in these *febrile* affections. Its influence over the circulation does not account for it, and it has been demonstrated to be independent of any action on the nervous system. Its power to diminish fever heat is therefore mainly due to its effect in *retarding oxidation* and tissue waste. Binz believes that quinine in *febrile diseases* "acts by directly combating the efficient cause of the disorder, and by checking the abnormal metabolism going on in the body, the nervous system taking no part, or only a secondary part, in the operation. It is possible that quinine prevents the growth of the organisms which exist in the blood, and which are the direct cause of the febrile condition in most cases, as has been demonstrated in malaria.

The red corpuscles are little altered or are increased in size, but are prevented from exercising their oxygen-carrying functions by large doses of this drug, and no increase is observed in the quantity of nitrogen in the urine in healthy subjects, quinine having a distinct depressing influence upon general metabolism, though the gaseous exchange remains unaltered. Wilde found that full doses completely paralyse contractile tissues, larger doses still cause the tissues to pass

into a state of rigor mortis, the cardiac muscle being extremely contracted.

Large doses (20 grs.) cause contraction of the gravid uterus.

In *intermittent fever* quinine cures the disease, and also affords marked but not always certain protection to those healthy subjects exposed to the malarial poison when given in doses of 2 or 3 grs. *ter in die*. From the lethal action of quinine on amœbæ, Binz suspected that *malaria* was produced by similar lowly organisms, because it was cured by quinine. It has been demonstrated that this is the case, and we know more about the action of this drug in the blood in disease than we know of almost any other remedy.

The parasite, or protozoon, causing the disease grows upon the red blood disc till it increases and occupies it entirely, rapidly forming spores, which are shed in enormous numbers free into the circulating fluid, each in its turn to seize upon a blood disc and go through the same cycle over again. It is found by administering quinine, and examining drops of blood at short intervals, that the action of the remedy can be demonstrated. In the milder malarial fevers it is found that the best results are obtained if the drug be administered in a full dose (15 to 20 grs.) about three hours before the expected paroxysm, which then comes on as before, but the new generation of young spores do not develop, and there may never be another attack. The spores are most susceptible to the action of quinine, and next come the large amœboid forms. In the severe Roman fevers, which are often rapidly fatal, no time must be lost, but 15 grs. of the hydrochloride should be given as soon as the patient is seen, the hypodermic plan being selected. Bacelli gives this dose by the veins. Upon the whole it is not a material point at what stage the drug be given. It will cure all forms of the disease, and in smaller doses, 3 or 5 grs. *ter in die*, it should be continued after the cessation of symptoms. Laveran advises an *interrupted* plan, by which 15 grs. daily are given for 3 days, then a rest for 4 days, after which the drug is given in lessened doses for 3 or 4 days more, with alternating rests till the 21st day.

In *remittent fever* quinine may be given in moderate doses during the remission, but it is advisable to give one full dose (10 to 15 grs.) at once without waiting for the remission.

Besides its use as an antipyretic remedy in *typhoid*, *typhus*, *variola*, *pneumonia*, and *acute rheumatism*, it has been employed with marked benefit in *various septic states*, and in *pyæmia* and all exhausting suppurative conditions. It has marked effect in cutting short the duration of *whooping-cough*, probably, as Binz believed, by killing the microbe, and in a similar way it shortens the attack of *influenza*. Weak solutions locally applied have been used in *hay fever*, *sore throat*, *whooping-cough*, and *diphtheritic ophthalmia*.

Quinine has been proved to be valuable in various forms of *neuralgia*, especially in those with well marked periodic exacerbations of pain, and in the *anæmic*, and in those suffering from prolonged worry and mental overwork. It should be given in 5 to 10 gr. doses at bed-time with a full opiate.

It has been recommended in *chronic suppurative bronchitis*, but the writer has found it often to increase the difficulty in coughing up the expectoration. It is probable that it exercises some toxic effect upon the cilia in these cases, muscles and bronchial tubes discharging the duty often silently performed by the cilia; at the same time the secretion is diminished in amount and increased in viscosity.

Quinine has been used successfully in the treatment of Ménière's disease in daily dosage of 12 to 15 grs., but is inferior to bromides.

The greater part of the quinine administered passes out of the body in the urine, the elimination lasting several days; some probably remains in the system; traces of the alkaloid have been found in the secretions of the skin, salivary glands, bile, and intestines. Iodide of potassium solution holding free iodine affords an easy method of showing its presence in the urine by causing a brown precipitate; the reaction may be demonstrated within 40 minutes after the quinine has been swallowed.

The *infusion* is by far the best form in which to administer cinchona elegantly and cheaply. It contains a higher percentage of alkaloids in proportion to the amount of bark used. The *official liquid extract* is a valuable preparation; it has been lauded in *dipsomania*.

Quinine may be given in powder, pill, cachet, mixture, by the rectum, or hypodermically. When a large dose (say 10 to 20 grs.) is to be given, by far the best way is for the physician to order it to be taken in wafer-paper; 20 grs. may be folded up in a disc of moistened wafer-paper, and swallowed like a spoonful of soft food, without the least inconvenience. Honey and tannin cover the taste of this drug.

The very soluble acid hydrochloride is a great improvement upon the almost insoluble sulphate, which should pass out of use entirely.

The combination of bark with a mineral acid cannot be more effectively produced than in the following excellent tonic :—

R. *Tinct. Cinchonæ* ℥iss.
Spt. Chloroformi ℥iv.
Acid. Nitro-Hydrochlor. Dil. ℥iv.
Syrup. Aurantii ad ℥iv. *Misce.*

Fiat mistura, cujus, capiat cochleare i. minim. ex paululo aquæ ante cibos.

Cinnamomum is a warm aromatic, acting as a true stomachic by a gentle stimulating action on the gastric membrane, increasing its secretion and assisting digestion ; hence its use as a condiment. It contains a small quantity of tannin, which renders it useful in *diarrhœa*, and it is recommended in *pulmonary* and *uterine hæmorrhage* : also some principle grateful to the stomach, which often assists it in overcoming *nausea*, or even *sea-sickness*. Drummond has obtained good results in *dysentery* from a decoction of the drug. Owing to its action in increasing the number of the white blood cells cinnamon has been highly recommended in *tuberculosis*. Cinnamic Acid, obtained by oxidising the oil, is the form used for this purpose. (See under Acid. Cinnamic.) The essential oil is a stimulant, and 4 min. doses will relieve *flatulent distension*, and a smaller quantity corrects the *gripping of purgatives*.

Cocaine.—Coca leaf, or its alkaloid, when taken internally in small quantity, is stimulating like caffeine, brightening the intellectual faculties, lessening fatigue, and greatly increasing the power of the voluntary muscles, quickening the pulse, and raising the body heat by its action on the heat centres. In larger doses mild intoxication with loss of mental controlling power, giddiness, and unsteady gait, may appear ; in most subjects a soothing or narcotic effect is produced, resembling that following small doses of morphia, but there is usually no after depression or languor experienced. In larger doses the hemispheres, medulla, and cord, at first stimulated, are weakened and finally paralysed. The *sensory columns of the cord* suffer, whilst the motor escape, the blood pressure falls, the temperature rises, and death results from paralysis of the respiration, the drug acting as a general protoplasmic poison.

Direct application of cocaine to the psychomotor centres of the dog produces a fall of their excitability, and when painted over the cerebral cortex electric excitability disappears. Large doses, by affecting the semicircular canals, cause peculiar motor disturbances.

Kochs has demonstrated its power of preventing the transmission of sensory stimuli by directly applying it to the sciatic nerve of the frog. After repeated applications the *motor* fibres in the nerve were also finally paralysed.

A few drops of a 2 to 4 per cent. solution deprive the conjunctiva of all sensibility, so that squint, cataract, iridectomy, and even the operation of removing the eyeball can be painlessly performed ; the range of accommodation is shortened, and the *pupil dilates*.

The same effect is produced when applied to the mucous membranes of the nose, mouth, palate, pharynx, larynx, vagina, os uteri, anus, and rectum. Solutions of various

strengths have been used, 4 per cent. for the eye, and 5 per cent. for the nose, mouth, and larynx. Murrell has obtained good results by an inunction of 20 per cent. in oil of cloves over the course of neuralgic nerves. Owen, by mixing an 8 per cent. solution with the official atropine solution, obtains an effective remedy for all *painful and inflamed conditions* of the *conjunctiva* and *cornea*, and Dr. Bradford finds by adding $\frac{1}{2}$ gr. of pilocarpine to 1 dr. of a 4 per cent. solution of cocaine that all the anæsthetic effect is produced without affecting in the slightest degree the accommodation. The hypodermic injection at several spots of $\frac{1}{2}$ to 1 gr. relieves and sometimes cures *neuralgia*, and enables the surgeon to perform minor operations painlessly. Schleich's method of producing local anæsthesia for large areas consists in injecting a very weak solution of cocaine, morphine, and sodium chloride into the derma at various spots, the injection being made from time to time into the deeper tissues during the progress of the operation. If adrenalin be added to the cocaine solution the operation may be rendered bloodless. For Bier's method of cocainising the spinal cord, see under Eucaine in the Non-Official Remedies. Bardet uses Cocaine 4 per cent. in ethyl chloride spray.

For *hay fever*, *pruritus* of the *anus* and *labia*, *vaginismus*, *fissure* and *ulcer* of the *anus* its use has been followed by relief, and it gives good results in aural practice also. Its local application (10 per cent. solution) in rigidity of the os has been found to cause complete relaxation.

Many alarming symptoms have followed the injection of even small quantities of the drug, and 3 grs. have proved fatal, but enormous doses are swallowed with impunity by those addicted to its use. It is a powerful protoplasmic poison, destroying amœbæ and growing cells.

The liquid extract of the leaves is a valuable tonic, stimulant, and restorative in various forms of *nerve exhaustion*, *neurasthenia*, and *melancholia*, and small doses of the alkaloid are valuable in relieving the pain of *gastric ulcer* and *persistent hiccough*.

A condition known as cocaineomania results from the prolonged administration of the drug—there are emaciation, quick pulse, and a sensation as if foreign bodies, like pebbles, worms, etc., were under the skin, loss of memory, sleeplessness, and delusions, for which nux vomica and strong coffee have been recommended.

Coccus.—The cochineal insect and its preparations are simply colouring agents, there being no reason to think that tincture of cochineal has any effect whatever in *whooping-cough* or other *spasmodic affections*. Its beautiful carmine colour is turned purple by alkalies.

Codeina possesses feeble narcotic powers. In large doses it increases the irritability of the spinal and cerebral motor centres, having a tetanising action like thebaine. Owing to its power over the visceral nerves it has been found very useful in soothing the cough of *phthisis* and relieving *nausea*, *hiccough*, and *visceral neuralgias*, and in lessening materially the amount of sugar in the urine in *diabetes*, in which disease it acts like a weak morphine preparation, but it does not disturb digestion or produce constipation.

Colchicum, in small doses by the mouth or hypodermically, increases the secretions of the stomach, intestines, and liver. In large doses, vomiting, purging, tenesmus, and inflammation result, and death occurs from irritant poisoning—the cerebral functions not being interfered with. The heart is only influenced indirectly, but the respiration is paralysed.

As a diuretic its action is most uncertain, and as a purgative its effects are too severe. Well-marked sedative influence on the heart and general circulation follows its administration, though this is largely reflex. The influence of the drug on healthy individuals and animals throws little light upon its therapeutic action, and it is noteworthy that in experiments on animals the heart is little if at all depressed, whilst in gout this depressing action must always be calculated on. Schulz and others have observed muscular and arthritic pains as the result of small doses in healthy individuals, and base upon this fact an explanation of its virtues in gout.

In *gout*, striking effects follow its administration, pain subsiding promptly, swelling disappearing, and the attack often vanishing after one or two doses. Some, however, believe that it is in no way curative, the relief being dearly bought, the pain returning with greater severity.

It is not easy to explain how it acts in these cases of *acute gout*, but we know it is not by exerting its purgative or questionable diuretic properties, since its good effects are constantly seen without either catharsis or diuresis being produced, though it acts better in conjunction with purgatives, and it does *not* increase the amount of urea or uric acid in the urine.

Paris noticed that alkalies softened its action, while acids rendered the drug more irritating. Magnesia makes a favourite corrective. The wine of colchicum is the best preparation for ordinary administration.

Though most beneficial in acute gout, it has been used in all stages of the disease, and in almost every disease occurring in gouty persons. 15 mins. of the wine may be given every 4 or 6 hours. The same plan may be adopted in the acute variety of the disease, though a full dose, say 30 mins., of the wine may be given, and repeated in 2, 3, or 4 hours while pain lasts.

Colchicum, from its stimulating action upon the liver, may be given advantageously with purgatives, and the addition of a few grains of blue pill and colocynth makes a very valuable purgative for gouty patients.

The following is a modification of Scudamore's mixture :—

R. *Vini Colchici* ʒij.
Magnesii Sulph. ʒx.
Magnesii Carb. ʒij.
Aq. Menth. Pip. ad ʒxij. *Misce.*

Fiat mist., sumat cochlearia duo amplā quartis horis.

Collodium and **Collodium Flexile** are only intended as external applications. When a little is brushed or dropped upon the skin the ether evaporates, leaving behind a thin film impervious to moisture. This contracts as it becomes more solid, until it puckers up the surrounding skin, and, by its pressure, partly empties the vessels of the part. It is generally used as a protective coating for *fresh wounds*, excluding air and all external sources of irritation, putting the wound almost in the same condition as an internal part, thus hastening repair. It is, however, used for its contractile properties in the treatment of small *nævi*, *port-wine marks*, *entropion*, etc., where it both diminishes the blood in the cutaneous vessels and gives support. M'Keown painted it upon the *relaxed membrana tympani*.

It is found that a layer of collodion possesses *electrical* properties, and thus affords a method of producing feeble doses of static electricity—the film is *negatively* charged as soon as it dries, and it has been used to relieve *hemi-anæsthesia*.

The flexible collodion does not contract so much as the other, but is less liable to crack with the movements of the skin. It is an excellent application to *erysipelatous* surfaces. Corrigan recommended it as a remedy for *nocturnal incontinence of urine*, painted over the child's prepuce at bedtime; and it has been used to cover the face in *smallpox* to prevent pitting, and as an application to *fissured nipples*. It is the best treatment for *scalp wounds*—incised, lacerated, and contused. As it dries, by its contractility it draws the edges of the wound together, prevents the admission of air, and does away with the necessity of a bandage. Collodion has been recommended as an application to sprains, and especially where the sprain is complicated with an open wound.

Colocynthis is an active purgative, causing copious watery motions by its local action, it also acts after absorption into the blood, from which it is eliminated by the intestinal glands, which it stimulates, increasing their secretion, and hastening the vermicular contractions of the bowel, making them painful and irregular. In large doses it acts as a violent irritant to

the canal, and may excite fatal inflammation or disturb the functions of the abdominal organs by reflex action, producing abortion, cystitis, etc. It is seldom given alone, but is a valuable addition to aloes, blue pill, and scammony. Colocynthin acts effectively when injected hypodermically or when given by the rectum.

Extract of hyoscyamus relieves the griping caused by colocynth, without detracting from its purgative properties. The compound pill is a valuable occasional purgative in *constipation of long standing*. It acts like aloes on the colon and (in full doses) on the liver; it is markedly diuretic, but it cannot be used for this action owing to its griping qualities.

R. *Pil. Colocynth. Co.* gr. iv.
Ext. Hyoscyami gr. $\frac{1}{2}$.
Ext. Belladonnæ Vir. gr. $\frac{1}{3}$.
Resinæ Podophylli gr. $\frac{1}{4}$. *Misce.*

Fiat pil. mitte tales xii. st. i. nocte, pro re nata.

Conium acts as a paralysing agent upon the peripheral motor nerves, like curare, the voluntary muscular tissue and the intellectual faculties usually remaining unimpaired.

The physiological effects begin to show themselves within half an hour after swallowing half an ounce or an ounce of the succus. Vision becomes a little affected by a paralysing influence on the third nerve, which causes slight drooping of the lid, slight dilatation of the pupil, and impaired movement of the eyeball, followed soon by general diminished motor power, as is seen in a wearied, unsteady gait, with languor and some listlessness, and even drowsiness. If a larger dose be now administered, the diminution of motor power is intensified, and the patient is unable to move, the knees bend on standing, the pupil may become more dilated, and the vision more confused, and fibrillary muscular twitchings or tremors may supervene.

Still larger doses produce complete paralysis of the *extremities of the motor nerves*, swallowing and phonation become impossible; and finally death occurs from asphyxia through paralysis of the respiratory apparatus, convulsions sometimes preceding death. Owing to the various amounts of coniine and methyl-coniine present in different samples of the drug its action is variable.

There is still much difference of opinion as to whether all the phenomena of conium poisoning can be explained upon the theory of a pure peripheral action; several authorities think that the drug has some effect upon the central nervous system, and Gubler believes that it influences the sensory nerves. Cash is of opinion that clinical observation favours this latter view, though the results are slight and uncertain.

Hemlock has been used in *mania*, *chorea*, and *paralysis agitans*, its value depending on its depressing influence over the extremities of the nerves distributed to the restless muscles. In *whooping-cough* it is also serviceable; in *tetanus* and *strychnine poisoning* its value is very doubtful.

In spasmodic affections, like *laryngismus* and *convulsions* occurring during *dentition*, hemlock may be useful, but it must be administered very freely. The only reliable preparation is the succus, which should be given in doses of 2 to 4 drs. every 3 or 4 hours, and little benefit may be expected till the physiological effects of the drug are noticeable—a slight disturbance of vision and gait. Ringer gave 7 drs. hourly to a choreic child, and children can bear large doses well as a rule. A child one year old should get more conium in proportion than an adult; 10 mins. to begin with is a maximum dose of the succus. It should, however, be rapidly increased, and the effects closely watched. When any difficulty of swallowing is observed, the use of the drug should be suspended.

Hemlock is said to cause the absorption of *effused inflammatory* products; and formerly it was classed on this account as a *solvent*, *deobstruent*, or *absorbent*. It is now seldom given internally.

Externally, conium has some sedative action. The writer, after repeated failures with cocaine and a host of local anæsthetics for the relief of rectal pain and itching, caused by *anal fissures*, found that an ointment of conium always gave relief. 10 grs. of the persulphate of iron may be added to each ounce in suitable cases, as recommended by Cripps. The B.P. authorities having accepted the author's formula, the ointment is now official. It paralyses the endings of the *motor* nerves distributed to the fine muscular layer under the surface of the mucous membrane; the reflex twitchings of this layer keep up the perpetual pain and uneasiness in diseases of the rectum and anus associated with abrasions, ulcerations, or fissures. At the same time the sensory terminals certainly seem to be depressed, and this constant and reliable action of conium in painful anal troubles convinces the writer that there are many important points in the pharmacology of the drug still awaiting demonstration.

The ointment will be found by far the best remedy for the pain of *fissures* and *ulcerated hæmorrhoids*, and the writer has seen anal fissures heal under its use. It should be inserted well up into the bowel. It speedily relieves all forms of *anal pruritus*, and it may be prescribed of double the B.P. strength. The following is a valuable formula:—

R. *Liq. Picis Carb.* min. xxx.
Unguenti Conii ʒj. *Misce.*

Copaiba and its official volatile oil act as mild irritants to the stomach, and in large doses excite nausea, vomiting, griping, purging, and sometimes strangury, with bloody urine. The drug acts on mucous membranes chiefly, and it is mainly for its effect upon the urethra that it is used in medicine.

Given in *gonorrhœa*, it at first slightly increases the flow, and afterwards controls it. It should not be given in the early or acute stages, or in larger doses than 30 mins., and often this dose upsets the stomach. It may act by destroying the specific poison which causes the inflammation. It is eliminated by the kidneys in combination with glycuronic acid, which gives a precipitate with nitric acid, which is soluble by heat; and it is eliminated also by the bronchial membrane and skin—all of which excretory organs are stimulated by it. It increases the watery element in the urine, and is used sometimes as a diuretic in dropsies of hepatic origin, but it may produce albuminuria, and is very irritating to the renal organs.

It acts by direct contact in *gonorrhœa* and *gleet*, and the writer has found benefit from injecting it into the bladder in *inveterate cystitis* in the female. He dilutes it with its own bulk of warm castor oil, and injects 1 oz. of it, allowing it to remain until expelled.

In *chronic bronchitis*, with profuse expectoration, *copaiba* often acts splendidly, and will be found in such cases the most reliable of the oleo-resins. It is occasionally used in *leucorrhœa*, and has been known to remove *psoriasis* which resisted all remedies. Its administration sometimes brings out a profuse rash not unlike measles, or urticaria, and this probably gives some explanation of its use in *psoriasis*, acting as a stimulant to the skin. It may be given alone, in water, or in the form of an emulsion with mucilage, egg, or liquor potassæ, or in a gelatin capsule, or better still, as a paste. (See under *Cubebs*.)

(GONORRHŒA MIXTURE.)

R. *Copaibæ* ʒvj.
Liq. Potassæ ʒiv.
Mucilaginis Acaciæ ʒiiss.
Spt. Æther. Nit. ʒiij.
Aquam Cinnamomi ad ʒviiij. *Misce.*

Fiat mist. capiat cochlear. i. mag. ter in die, p. p. a.

Coriandrum.—An aromatic carminative, identical in its effects with *Anethum* and *Anisum*. 3 mins. of the oil may be given on sugar, for *colic*.

Creosotum possesses many properties in common with *Acid. Carbolic.* (which see); it is, however, much less toxic. It is

speedily absorbed on entering the stomach, and does not undergo any marked change in the blood. It is eliminated by the bronchial mucous membrane, which it stimulates, thus becoming an expectorant especially valuable if there be any fetor of the secretion, as in *chronic basilar cavity*. It is the best routine drug in ordinary *phthisis*. It may be given by the mouth, hypodermically in oil, by the rectum, applied with friction to the skin, or sprinkled on an inhaler; or in all these ways at once, constituting the so-called "intensive" method, and up to 30 mins. daily may be administered. Harry Campbell states that he has given drachm doses *ter in die* without any inconvenience. (See also Guaiacol.) It also passes off in the urine, and is believed by some to be diuretic, and the writer has found it valuable where the urine is foul smelling. He has kept samples of urine exposed to the open air without change for 14 days from patients who had been taking creosote. In very large doses it is a violent irritant poison, resembling carbolic acid, only it does not produce convulsions, and does not render the blood less coagulable.

Small doses have a sedative action upon the terminal nerve filaments distributed to the gastric mucous membrane, and correct *nausea*, *gastralgia*, and *vomiting*, whether caused by local mischief or of a reflex character, as in *sea-sickness* or *pregnancy*. 2 or 3 mins. frequently arrest *fermentative* and *putrefactive changes in the stomach*, for creosote, like carbolic acid, is a powerful antiseptic. It may be given in pill, or dissolved in cod liver oil, or in a mixture, and it is to be remembered that it explodes when combined with oxide of silver in the pilular form, unless it is previously diluted with some inert powder. But the gelatin capsule is by far the best form for its administration. In *tuberculosis* the drug may be given in doses up to 15 mins. per rectum, mixed with 2 or 4 ozs. emulsified cod liver oil. Splendid results have been reported from this plan in tubercular peritonitis. Externally, it acts like carbolic acid, and relieves the pain of an *exposed dental nerve* effectually; and in the form of the ointment it is useful in *ulcers* and the *scaly skin diseases* where tar is indicated, and it relieves the itch of *eczema*. As an inhalation in *chronic bronchitis* and *gangrene of the lung*, creosote is beneficial. In *tuberculosis* it probably combines with and neutralises the poison produced by the bacilli. It has no influence in diminishing the number of the bacilli seen in the sputum.

Creta and **Creta Præparata** are mild antacid remedies, useful where we wish to reach the *intestinal* surface with an alkali. (Their action is explained under Calcium Carbonate.) The aromatic powder is a valuable remedy in the

diarrhœa of childhood ; it may be given as a powder or in a mixture.

(FOR A CHILD FOUR YEARS OLD.)

R. *Pulv. Cretæ Aromat.* ʒij.
Syrupi Simplicis ʒj.
Spt. Chloroformi ʒj.
Aquam ad ʒiij. *Misce.*

Fiat mist. sumat ʒi. *tertiis vel quartis horis, p. p. a.*

Crocus.—Saffron may be said to be only used for its colour and flavour. It was much esteemed long ago as an emmenagogue, and was believed to possess the property of increasing the rash in the *exanthemata*.

Crotonis Oleum is a powerful drastic or irritant cathartic, causing copious watery motions often in less than one hour after a medicinal dose. It does not act entirely as a local irritant to the intestines, as was supposed, but a part of it may be absorbed, and entering the blood, circulates with it till it reaches the intestinal glands, which it stimulates to increased action, and it quickens the peristaltic movements. The same effects are sometimes said to follow its application to the skin with friction as are observed after swallowing it. In the intestine it is converted into glycerin and crotonoleic acid which causes the purgation ; some samples of the oil contain this acid, which is a powerful irritant. In large doses it is a violent poison, acting as a local irritant, and causing inflammation of the digestive tract, or death from collapse. Its rapid action renders it a valuable purgative, where time is a consideration, as in *head injuries*, *acute mania*, *delirium tremens*, and *brain disease*, and in very *obstinate constipation*, when we are sure the lower bowel is freed by enemata. It may be given in pill, 1 min. acting as an efficient cathartic ; or in *apoplexy* it may be rubbed up with about 5 grs. of sugar, or a little butter, and placed on the root of the tongue.

Externally, croton oil is a strong irritant when applied to the skin, bringing out an eruption, at first papular, but soon passing into pustulation. It is not, however, as painful a counter-irritant as might be expected. The linimentum crotonis is an excellent rubefacient in *acute bronchitis*.

The application of croton oil to *ringworm of the scalp* has been successful, but it sometimes causes baldness.

Cubeba resembles Copaiba in its action, but possesses a milder stimulating and alterative influence over the genito-urinary mucous membrane and rectum. With caution it may be used in the early stage of *gonorrhœa*. Made into a paste with copaiba, and a little nitrate of potassium added, it can be bolted in wafer paper in doses the size of a hazel-nut.

The same paste will often give relief in *bronchitis with profuse expectoration*, when other measures fail ; and it is an excellent remedy for *piles*, if made into a paste with *glycerin*, and bolted in a similar way.

R. *Pulv. Cubebæ* ʒij.
Pulv. Potassii Nit. ʒij.
Pulv. Doveri ʒss.
Copaibæ q.s. ut fiat

Electuarium durum, ʒi. *ter die sumendam post cibos.*

Cupri Sulphas given in small doses ($\frac{1}{2}$ gr.) acts somewhat like the lead and silver salts. It has nervine tonic properties, and has been given in *epilepsy*. It is a strong astringent, and is used in chronic *diarrhœa*. In larger doses (5 to 10 grs.) it is a speedy emetic, acting like sulphate of zinc, in formidable *poisoning* cases, especially in phosphorus poisoning, and in larger doses it is a powerful irritant poison, producing paralysis of the respiratory and cardiac centres.

Externally, it is a valuable astringent, appreciated in veterinary practice, and the solid salt rubbed over *sluggish sores* destroys unhealthy granulations, and it is a powerful local stimulant. 3 grs. to 1 oz. water make a lotion which may be applied to *chancres* and *ulcers* ; or injected into the urethra in *gleet* ; or into the vagina in *leucorrhœa* ; or brushed over the lids in *ophthalmia*.

Its prolonged administration stains the gums or teeth with a blue or green line like that seen in *lead poisoning*. It is eliminated by the skin, kidneys, mucous membranes of the gall bladder, stomach, and bowel, but it is stored in the liver for long periods.

Cusparia is a tonic possessing aromatic and febrifuge qualities ; in large doses it causes vomiting and purging, but in medicinal doses (30 grs. of the powder) it is useful in *malaria* and the *fevers of the tropics* and in *dysentery*, though it is almost devoid of astringency.

Cusso, when taken in large doses, sometimes causes both vomiting and purging. It kills *tenia solium* and *bothriocephalus*, for in the doses usually given it does not often purge, but kills the parasite by direct contact.

2 to 4 drs. of cusso infused in 4 ozs. of boiling water, and swallowed without straining, are taken for one dose ; and, like all other vermicides, it acts more certainly if given when the stomach and intestines are empty, and if followed soon after by a mild purge ; the worm is expelled dead, and often in small fragments. The active principle—Kosotoxin—is a powerful protoplasmic poison.

Digitalis acts powerfully upon the cardiac muscle, increasing its tone. Medicinal doses lengthen and strengthen the ven-

tricular contractions by their direct action upon the cardiac muscular fibre, raise the blood pressure and slow the pulse by stimulating the vagus roots, and the peripheries of the cardiac nerves. Large doses increase the frequency of the pulse by paralysing the vagus roots, the blood pressure still rising. Larger doses cause irregularity of the heart's action and pulse by their effect upon the heart itself, and if the doses be repeated the blood pressure falls and the heart becomes finally paralysed, the respiration previously having been also weakened, though the motor and sensory nerves, cord and cerebrum remain unaffected. These results may be summarised by adopting Schmiedeberg's method of dividing the action of digitalis into four stages, thus :—

1. Increase of cardiac pulsation, slowness of pulse, and rise of blood pressure.
2. Quickness of pulse (effect on cardiac vagus filaments), continued high blood pressure, and increase of urine.
3. Irregularity of heart and pulse (effect on cardiac muscular fibre).
4. Increased irregularity and weakness of heart and pulse, fall of blood pressure, failure of heart and respiration, and death.

In the main, the action of digitalis upon the frog's heart corresponds to its influence upon the mammalian heart ; it increases its tonic activity by its direct effect upon the muscular fibre, though in the frog the heart is arrested in systole, whilst in the mammal the organ stops in diastole.

The most important action of the drug is that of a true cardiac tonic, which it exercises firstly by its *direct* effect upon the cardiac muscle, increasing its tonus and power ; secondly, the diastole is prolonged ; and thirdly the ventricles are slowed. Both of the latter effects are brought about by the stimulation of the inhibitory vagal mechanism, chiefly of its peripheral portions. Its action upon the bloodvessels is scarcely less important, especially from the therapeutic standpoint. These are markedly constricted, and there is little doubt that their contraction is mainly due to the *direct* action of the drug upon their muscular walls—a similar phenomenon to that observed in the muscular walls of the ventricles, though stimulation of the vasomotor apparatus probably also plays a secondary part.

In the treatment of disease the drug should not be pushed beyond the first stage, which is recognised as the *therapeutic* stage of digitalis action. It is now recognised that the result of the increased blood pressure is not to be mainly accounted for by the increased action of the heart, but by the *contraction of the arterioles* throughout the body. It acts as a diuretic mainly by raising the blood pressure in this way ; its diuretic action is, however, slight in health, but marked in heart disease.

Digitalis, on account of its strengthening action on the heart, may be given in all cases of *weakened contraction from valvular disease except one*. It acts in valvular disease by strengthening and slowing the heart's movements, so that the overburdened ventricle or auricle gets longer time to contract, and thus more effectually drives the blood through a narrowed orifice. In the case of *mitral obstruction* the time during which the blood flows from the distended auricle into the ventricle is increased, and when the former contracts it has less to expel, and hence does its work better. The exception to its use is in the *early stage of aortic regurgitation*, where, after each contraction of the heart, the blood, which should be forced along the aorta, finds its way back into the wearied ventricle, breaking upon its repose. As the diastole is prolonged by the digitalis, the duration of this backflow is increased, the mischief is aggravated, and grave danger may result. Later on, however, when the pulmonary circulation is affected, and through it the right and left ventricles become implicated, digitalis is clearly indicated.

In simple aortic obstruction, as in any other valvular lesion without cardiac symptoms, the drug should not be given, and it is especially dangerous in atheromatous conditions of the vessels and in fatty degeneration of the cardiac muscle, in which latter condition it may cause sudden death by the increased blood pressure produced by the constriction of the vessels overcoming the force of the degenerated muscular fibres of the left ventricle.

Ringer points out that "the irregularity of the pulse is the capital indication of the necessity of giving digitalis," and it is often valuable in palpitation and irregular action of the heart not depending upon valvular disease.

Sansom says: "Digitalis is *facile princeps* of drugs in the treatment of imperfect compensation. It so influences the cardiac ganglia as to induce a more perfect contraction of the ventricular muscle, and hence a more complete emptying of the ventricles; whilst, at the same time, by an action on the vasomotor centres, it causes contraction of the arterioles and a heightened tension in the arterial system. It slows the heart by lengthening the diastolic pause; so not only does it give rest to the wearied cardiac muscle, but as this muscle is nourished only during such diastolic pause by the blood which then enters through the coronary arteries it directly ministers to its nutrition."

Hare demonstrated that digitalis administered to young pigs for $4\frac{1}{2}$ months caused a genuine hypertrophy of the cardiac muscular fibre, and increased the weight of the heart, the increase corresponding to the extra growth in each fibre.

$\frac{1}{2}$ oz. doses of the tincture have been used in *delirium tremens*; this is not a method of treatment to be recommended.

It reduces the temperature in *inflammatory conditions*, and as an antipyretic is still occasionally used on the Continent. Though this action is not to be relied upon, nevertheless it is useful in conditions like *acute pneumonia*, in which disease Petresco gives from 60 to 120 grs. of the leaf in infusion in 24 hours, and states that he has never seen poisoning, and his mortality is only 1·22. Others insist upon the grave danger of such doses.

It is used in *internal hæmorrhages*, because of its influence in contracting the arterioles, but it is very uncertain, owing to the increase in the general blood pressure. It causes contraction of the *uterine muscular tissue*, and is useful in *menorrhagia*.

In the *dropsy* of valvular disease, the diuretic effects of this drug are often astounding. Given to assist the kidneys, where many quarts, or even gallons, of fluid are shut up in the peritoneal cavity or cellular tissues, from an obstructed cardiac circulation, it has been seen to increase the scanty urine from several ounces to as many pints in 24 hours. In these cases it acts by striking at the cause of the dropsy, through its power of raising the blood pressure in the renal glomeruli, and at the same time increasing the pumping power of the heart.

After the disappearance of the dropsy it has very slight power of increasing the amount of water or urea eliminated. The most active of the glucosides is digitoxin, and it is only soluble in alcohol; the tincture is believed to be the most suitable Galenical preparation, but the infusion and powdered leaf are also very reliable. (See under Digitalin.)

The drug is eliminated by the urine, and when administered for some time, occasionally without warning, produces symptoms of poisoning as if a very large and dangerous dose had been taken. This is spoken of as the *cumulative* action of the drug, and it arises from its elimination by the urine being retarded. When the blood pressure rises very high the excretion of urine stops and the drug consequently accumulates rapidly in the blood. This may be prevented by keeping the patient strictly confined to the recumbent position, watching the urine, and stopping the administration when the secretion becomes scanty and the pulse very slow or the heart irregular. Even when there has been no diminution in the renal secretion under its use a sudden change from the recumbent to the erect posture has been known to cause a fatal syncope when full doses have been administered for a considerable period.

Great benefit may be obtained by combining the vasodilator action of the nitrites with digitalis in cases where the blood pressure is too high. It must not be forgotten, however, that the action of the digitalis is almost continuous, whilst that of the nitrites is very evanescent.

Externally, an infusion applied to any extensive surface is sometimes absorbed.

Baly's or Guy's pill, which usually is made to contain 1 gr. each of powdered digitalis, squill, and blue pill, is a favourite diuretic in *cardiac dropsy*.

Niemeyer's pill, much used in *phthisis*, contains $\frac{1}{2}$ gr. digitalis, 1 gr. quinine, and $\frac{1}{4}$ gr. opium; and Heim's pill is the same, with the addition of $\frac{1}{4}$ gr. ipecac. and the omission of quinine.

Iron, though incompatible with the tannin of digitalis, is often prescribed with advantage; the following formula gives a clear elegant mixture:—

R. *Tincturæ Ferri Perchlor.* ʒiij.
Tincturæ Digitalis ʒij.
Acidi Phosphorici Dil. ʒiij.
Aquæ Destillatæ ʒviij. *Misce.*

Fiat mistura, sumat ʒss. ter in die ex aqua post cibos.

Elaterin and Elaterium.—The latter is only used to prepare elaterin, which is the most violent purgative known. Belonging to the hydragogue class, it produces profuse watery evacuations by its stimulating and irritating action on the intestinal glands. Externally, it is a strong irritant to moist surfaces.

In the treatment of desperate conditions—like *apoplexy*, etc.— $\frac{1}{10}$ gr. will draw off as much water and serum from the blood as a copious blood-letting. The $\frac{1}{20}$ gr. is a good average dose, and, owing to the discharge of water produced by it, it is useful in *dropsies*, or in accumulation of fluid from any cause, especially where the kidneys are congested or fail to do their office, and the heart is not too weak. Its great use lies in its application to cases of formidable and *sudden anasarca* threatening life by its rapidity, as in *œdema of the lung*.

5 grs. of the compound powder, put on the tongue and washed down with a spoonful of water, should purge in a few hours.

It requires bile for its purgative action; if injected under the skin, Brunton says it produces *dyspnœa* and *tetanus*. Other authorities state that it purges, but in any case it cannot be used in this way, as abscesses form at the seat of puncture. The student should note the dose of elaterin— $\frac{1}{20}$ gr.—while elaterium may be given in 10 times this quantity. The writer has sometimes found elaterium to fail completely even in large doses. It is uncertain in its action, and must not be always relied upon.

Emplastra.—The B.P. plasters are chiefly used for their physical quality of adhesiveness. By strapping so that a grip can be obtained on the surrounding elastic tissues, consider-

able pressure can be constantly kept up, and in this way *inflammatory products* may be absorbed, especially if of *syphilitic* origin, the ammoniacum and mercury, or the mercury plaster, answering this end very well. *Pain* may be relieved by the menthol, belladonna, or opium plasters, while feeble counter-irritation and active rubefaction may be produced by calefaciens and cantharides respectively.

With the exception of cantharides, all the plasters promote the absorption of superficial inflammatory deposits by protecting the part from variations of temperature. By checking evaporation the local temperature is increased, and the superficial part partakes somewhat of the benefits of an internal position, and glandular and lymphatic action becomes altered, as is seen in the resolution of *chronically inflamed glands and joints*. The belladonna plaster has frequently caused poisoning, owing to the absorption of the alkaloids through the skin. This is especially liable to occur when a breach of surface has been produced by retained secretion of sweat.

Ergota is chiefly employed in medicine for its powerful stimulating action upon the muscular tissue of the gravid uterus. Owing to the complex nature of the various active principles contained in ergot and the great difficulties in isolating them, experiments conducted with them have led to confusing and contradictory results. *Cornutine* produces convulsions from its action on the medulla and a slow prolonged contraction of voluntary muscle and of the uterus, with increased blood pressure and slowing of the heart. *Spha-celinic acid* has the remarkable power of producing dry gangrene of the arterial type, as may be seen in the comb of the cock, after large doses. It has been noticed that where ergot has been taken for any time in the rye-bread used by peasants, *gangrene* and *paralytic symptoms* have supervened, though these are rarely seen after the prolonged medicinal use of the drug. Large doses of ergot cause vomiting and purging, paralysis, inco-ordination, muscular spasms and convulsions, and death preceded by fall in body temperature. (See under Ergotin in Non-official Remedies.)

Moderately large doses of powdered ergot, its extract, or its infusion, cause contraction of the involuntary muscular fibre throughout the body, the arteries and veins diminish rapidly in calibre, and the vessels of the spinal cord are more especially contracted; there is a marked rise in blood pressure from stimulation of the vaso-motor centre and from the direct action of the drug upon the vascular walls. It is noteworthy, as pointed out by Bradford, that the rise in pressure in the pulmonary artery is rapid and continuous. The heart is little affected by moderate doses, though the pulse falls a little, but the uterus is powerfully influenced through its

action upon the lower spinal centres, and on the bloodvessels, and probably also by its direct action on the muscular tissue.

In *internal hæmorrhages*, 20 mins. of the liquid extract every three hours is given for the relief of *hæmoptysis*. In *urgent* cases the same amount may be injected under the skin every fifteen or thirty minutes. It is used in all *hæmorrhages*, but it is very doubtful if it has any action whatever in internal hæmorrhage (save in uterine bleeding) owing to the fact of the blood pressure being raised. It has been vaunted as a remedy in *aneurisms* and *goitres* when injected into the tissues surrounding the sac, also it has been tried in *enlarged spleen* and *spinal congestion*.

It is, however, in *obstetric practice* that the virtues of ergot are appreciated. By acting on the uterine fibres it produces powerful tetanic contraction, and assists to expel the contents of the organ. 30 grs., infused for ten minutes in boiling water, will often arouse the slumbering energies of the uterus within ten minutes, but its administration requires discrimination—thus, it should not be given if there be any impediment to the descent of the head, or if the pains are already good; and sometimes it exerts dangerous pressure upon the child by its tonic action on the uterus, and it may weaken the foetal heart. It may cause irregular action of the muscular tissue ending in retained placenta. Small doses increase the rhythmic or intermittent contractions, but large doses produce a tetanic prolonged contraction. In the early months of pregnancy it feebly affects the organ, but its power over it increases with every month of gestation. It is the best remedy we have for the relaxed condition, causing *post-partum* hæmorrhage, where it may be given in drachm doses, or 10 mins. of the hypodermic injection may be injected *deeply* into a muscle or into the uterine walls in desperate cases. *Subcutaneous* injection is more likely to be followed by irritation and abscesses. Good results follow its use in *sub-involution* and *menorrhagia*, and various forms of *uterine fibroid tumours*. For *fibroids* Schucking injects ergotin into the lip of the os uteri. Most authorities agree that the abdominal wall must not be selected, and that the deep muscles of the buttock afford the best spot. The solution should be always freshly prepared.

Eserine. (See under Physostigma.)

Ether. (See under Æther.)

Ethyl Nitritis Liquor acts like sweet spirit of nitre and amyl nitrite. Under this latter drug the action of the nitrites as vaso-dilators is described. It is used in all cases where there is high arterial tension, as in *angina pectoris*, cardiac, renal, and pulmonary *dyspnœa*, *epilepsy*, *sea-sickness*, and various forms of *headache*. The liquor rapidly decomposes, and

should not be prescribed in mixtures with water. Its action is much more prolonged than that of Amyl Nitrite.

Eucalyptus Oil is a powerful volatile antiseptic, destroying minute organisms. In some respects, its action resembles quinine, thus it arrests the movements of the white corpuscles and causes the spleen to contract. It is a diffusible stimulant like turpentine, stimulating and afterwards depressing the central nervous system and respiratory centre, and acting upon the kidneys. Externally it is a rubefacient, and if covered with oiled silk it will blister. It is given in feverish septic conditions, and good results have followed its use in *puerperal fevers*, *pyæmia*, and *septicæmia* in 5 min. doses. It reduces the temperature, and has proved curative in *ague*; during its elimination by the bronchial mucous surface and the renal tract, it is a disinfecting remedy in *phthisis* and *fetid bronchitis*, and in *cystitis* and *gonorrhæa*. It has been given hypodermically in liquid paraffin, and as an inhalation in the *exanthemata*, *pertussis*, and *diphtheria* by enveloping the patient in an atmosphere of eucalyptus vapour. In *influenza* this has become the popular practice. It affords the best routine treatment of *scarlatina* used as an anointing oil (1 part to 3 of olive oil) from the beginning and all through the desquamative stage, where it thoroughly disinfects the shed epithelium.

Locally the vapour has been used as an inhalation in *gangrene of the lung*, *phthisis*, *ozæna*, *diphtheria*, and a dilute solution is employed to wash out cavities and *irrigate foul wounds*. Made into a pessary, it has been used in *cancer of the uterus and rectum*, and as a gauze it is used as an antiseptic surgical dressing.

Eucalyptus gum is an astringent acting like tannin in *diarrhæa*, *dysentery*, etc. It is used also for *relaxed throat* and in *hæmorrhoids*.

Euonymus and the dry extract known as Euonymin are cholagogues increasing materially the excretion of bile. It is a reliable cathartic, in some respects resembling podophyllin, but very much milder in its action. The experiments of Rutherford proved that it increased the amount of bile flowing into the intestine of dogs. Its chief indication is in *torpidity of the liver* in stout patients, who live too well. In the early stages of *cirrhosis* it is useful, and some cases of *chronic constipation* yield to 1 gr. doses twice a day. 3 grs. may be given as a brisk purge, followed, if necessary, by a saline.

Fel Bovinum is seldom employed in medicine, even when there is reason to suspect that the natural secretion of bile is deficient; the bile is known to assist the emulsification of fats, to act as an antiseptic and purgative, and to facilitate the absorptive powers of the mucous membrane. It has been

recommended by White as an addition to enemata in *fæcal accumulations*. It may be given in 15 gr. doses as a bolus, or wrapped in wafer-paper.

Ferrum.—Iron is a true restorative or hæmatinic, and also it must to some extent be considered as a food, though in medicinal doses in health it does not increase the number of the red corpuscles. It increases the appetite somewhat, but if the astringent preparations be administered, nausea and constipation may result; in any case the stools are black, and sometimes the bladder is irritated. None of these effects throw any light upon the action of the drug in disease. Stockman, to whose researches we owe so much, gives the amount of iron necessary for a healthy man daily as $\frac{1}{11}$ to $\frac{1}{8}$ gr., and the total amount in the body at about 40 grs., nearly all of which is in the hæmoglobin.

The various iron preparations are changed in the stomach into ferrous chloride, a trace of which is absorbed, a portion of the remainder being converted into carbonate and hydroxide in the duodenum, but the great bulk of it passes down the bowel to be changed into sulphide before passing out unabsorbed in the fæces. The small amount absorbed finds its way through the epithelium of the duodenum, after which it is seized by the white corpuscles of the blood and carried into the general blood stream, where it can be identified in the form of minute granules in the protoplasm of the cells on their way to be stored up in the liver. From the liver it ultimately emerges as hæmoglobin.

It is excreted by the urine ($\frac{1}{65}$ gr. daily), but mainly passes out of the body by the fæces, after being eliminated by the mucous membrane of the lower part of the colon.

Iron is the type of a restorative, general tonic, or hæmatinic. It directly affects the blood in *anæmia*, increasing the red corpuscles, and thus enriching nearly all the tissues with an increased supply of oxygen. The brain and nervous system benefit by its ozonising properties; their tone rapidly improves, and hence its great value in *exhaustive mental overwork* and *neuralgia*, where iron is a tonic in the true sense of the word. In recovery from *fevers*, especially in cases where there has been *much brain activity* or *prolonged delirium*, the use of iron is often attended with the best results.

Bunge maintains that in *chlorosis* the inorganic iron administered does *not* go to form hæmoglobin, but simply protects the iron in the food from being converted into inert sulphide in the bowels. The vexed question of how iron acts may be said to be now settled by the able researches of Stockman and others, who have demonstrated that the metal is absorbed. Stockman obtained striking results in *chlorosis* by the hypodermic injection of small doses of the ammonio-

citrate, and he has proved the fallacy of Bunge's theory by curing anæmia with the supposed inert sulphide. When the object is to saturate the system with iron the non-astringent preparations should be selected, as Blaud's pill or reduced iron, though Ringer insists upon the superiority of astringent salts like the sulphate and perchloride in small and frequently repeated doses. Lepine strongly advocates the hypodermic use of $2\frac{1}{2}$ c.c. of a 4 per cent. solution of the citrate into the buttock. Iron should always be given after food.

It would occupy much space to mention the ailments for which iron is so highly praised, but many will be included by saying that in *anæmia*, from whatever cause, this drug may be freely given, though it has little, if any, action in pernicious anæmia, unless when combined with arsenic. It seems to possess specific power over *erysipelatous inflammations* when taken in large doses, and in *chlorosis* its effects are beyond doubt.

In *Bright's disease*, *heart affections*, and *scrofula* it is most valuable.

Externally, the perchloride is a powerful astringent, and the strong solution acts upon the bloodvessels, and hardens the tissues, acting as a styptic by coagulating albumin.

The scale preparations are favourites, especially the citrate with quinine, which, however, cannot be ordered with alkaline carbonates.

R. *Ferri et Quininæ Cit.* ʒij.
Spiritus Chloroformi ʒij.
Inf. Calumbæ ad ʒx. *Misce.*

Fiat mist. st. coch. i. mag. ter in die.

The citrate may be given in effervescence, and makes a most elegant and palatable chalybeate mixture—the citric acid being prescribed along with it, whilst the alkaline solution is added just as the patient is about to swallow the dose.

Iodide of Iron will be found invaluable in *struma* and *syphilis*, and in the form of the syrup is well suited to the taste of children.

(FOR A CHILD TWO YEARS OLD.)

R. *Syrupi Ferri Iod.* ʒij.
Olei Limonis gt. iv.
Syrupi Simp. ad ʒiv. *Misce.*

Fiat mist. capt. coch. i. min. ter in die.

Tinct. Ferri Perchlor. is, perhaps, the best and most used liquid preparation of iron. It cannot be given with alkalies. If ordered with substances containing tannin, like digitalis and ergot, the mixture can be made bright by the addition of a little Acid. Phosph. Dil. When prescribed with Liq. Ammon.

Acet. it forms Basham's mixture, containing acetate of iron in elegant form.

R. *Tr. Ferri Perchlor.* ʒiv.
Liq. Ammon. Acet. ʒij.
Syrupi Simp. ʒj.
Aquam ad ʒviiij. *Misce.*

Ft. mistura, cpt. ʒss. ex aqua ter in die.

Glycerin is the best corrective to order with the liquid iron preparations, and makes a much more agreeable mixture than if spirit of chloroform be used, though the latter prevents the iron from causing any gastric irritation, and is sometimes retained when the stomach rejects more elegant combinations.

The *Syr. Ferri Phosph. Co.* (Parrish's) is not in the B P. It is known as Chemical Food, and is about double the strength of the B.P.C. syrup. The Syrup of Phosphate of Iron is useful in the dyspepsia of anæmic patients.

Mistura Ferri Co. long maintained its supremacy amongst the iron preparations as a remedy for *absent or scanty menstrual discharge*. It is now less frequently employed, since the pill of iron has come into such general use.

The *Saccharated Carbonate* is an agreeable but unstable form for the administration of iron.

The *Sulphate* is a good tonic and astringent, and is a valuable addition to purgatives. It enters into Blaud's Pill, but the iron becomes changed into carbonate, and it is now one of the most frequently ordered of all remedies for *amenorrhœa*. In this form it does not cause constipation; 9 pills may be given in the day.

Ferrum Redactum is a plain chalybeate without astringency.

R. *Ferri Redacti* gr. v.
Glycerini Tragacanthæ q.s. *ut fiat pil.* *Misce.*

Mitte tales xxiv., st. i. ter in die post cibos.

Notwithstanding all that has been said in favour of the innumerable new organic salts of iron, these do not appear to possess any superiority over the older inorganic preparations.

Ficus.—The fig is nutritious, and acts as a mild laxative. When taken in large quantities it causes griping, probably by the presence of the indigestible fruits, or so-called seeds, irritating the mucous membrane, and setting up irregular and painful contractions. Split open and heated, figs make a popular emollient poultice.

Filix Mas is the most reliable remedy against the *tænia solium*, *t. mediocanellata* and *bothriocephalus*. It should be given to an adult in 60 min. doses, early in the morning, after

a previous castor oil purge administered at bed-time, to insure the complete emptiness of the bowel; or it may be given at night, after fasting, and be followed by a purge next morning, though this is seldom necessary, a full dose of the liquid extract generally acting as an effective purge. Care should be taken to look for the head of the worm, for until this is obtained there is doubt of its destruction. The fern seems to act as a direct poison to the parasite. It may be combined with turpentine, or given in capsules. It is not advisable to give more than 90 mins. in a single dose, death having been caused by less than three times this amount. Jaundice and amaurosis have been reported as untoward effects in a few cases.

10 mins. tincture of senega will emulsify 1 dr. of the drug.

R. *Ext. Filicis Liq.* ʒj.
Spt. Terebinth. ℥.xxxv.
Ovi Vitelli i. *Misce et adde*
Aquæ et Syrupi q.s. ad ʒij.

Fiat haustus, mane sumendus.

Foeniculi Fructus.—Fennel acts like Anethum (which see). In addition to its aromatic qualities, it is supposed to have the power of increasing the flow of milk. The water is a favourite antispasmodic for infantile colic, in teaspoonful doses.

Galbanum resembles asafetida in its action, only it is feebler, and should be omitted from the B.P.

Galla.—Since the value of galls depends upon the tannic and gallic acids contained in them the reader is referred to Acid. Gallicum.

Gelatinum is made official in order to obtain a basis for glycerin suppositories. Carnot has demonstrated its value as a powerful hæmostatic and styptic, first discovered by Dastre; 5 per cent. solution may be applied on lint to wounds and in epistaxis. Recently a hypodermic dose of 30 or 40 grs., in absolutely sterile saline solution, has been proved a valuable hæmostatic in hæmoptysis and in typhoid, purpuric, and other internal hæmorrhages. Sterile solutions in glass tubes are now supplied by Martindale in a reliable and convenient form. It seems also probable that by the mouth the drug acts as a local hæmostatic if given in the form of jelly in all hæmorrhages from the stomach and small intestines; it is also useful in the diarrhœa of childhood.

It has been injected hypodermically, also in cases of slowly uniting fractures and in cases of aneurism; kidney disease is a contra-indication to its use.

It has been proved of great value in uterine and *post-partum*

hæmorrhage when injected (10 per cent. solution) into the uterus, or where this organ is packed with gelatin gauze. Tetanus has many times occurred from the injection of non-sterile solutions, and Merck's sterilised 10 per cent. solution may be given hypodermically in doses of 50 c.c.

Unna makes gelatin the basis of many valuable skin preparations. See Non-Official Remedies.

Gelsemium is a drug of very doubtful value. Full doses produce brow-ache, giddiness, staggering gait, double vision, squint, ptosis, dropping of the jaw, numbness of the fingers, and a peculiar expression of countenance, chiefly owing to loss of power of the ocular and facial muscles.

In poisonous doses the patient becomes unable to articulate or walk, the breathing becomes laboured, a peculiar tremor of the head and often of all the voluntary muscles is noticed, sensibility is but slightly impaired, the pulse becomes quick, the respiration gets slower, the motor columns of the cord and the motor nerve endings are depressed, and paralysis of all the muscles in the body follows, and the temperature falls. The writer found a patient clinging to a lamp-post in the street with most of these symptoms well marked after two doses of $1\frac{1}{2}$ grs. each of the old B.P. alcoholic extract. There are great differences in the susceptibility of different individuals to the drug. Convulsions precede death, which results from paralysis of the respiratory centre.

Gelsemium has been found to possess power over *migraine* and *neuralgia*, and has relieved even when the cause was not removed, as in caries of the teeth and alveoli. The writer has seen benefit from it in severe *tic*. It often appears to exert most power over neuralgia of the branches of the 5th nerve supplying the lower jaw. The administration should be stopped after ptosis and staggering have been noticed. 10 mins. of the tincture may be given every 3 or 4 hours.

Bartholow used it in *pleuritis* and *pneumonia* (where it appears to relieve as aconite does), and in *asthma*, *laryngitis*, and *spasmodic coughs*, of various kinds; but to be really beneficial in these cases it must be given in doses approaching the dangerous. It has been given in the *hæmoptysis* of *phthisis*, and to cause dilatation of the rigid os, and applied locally to the eye to cause dilatation of the pupil, though the pupil is often found to contract after full doses given internally, but it dilates before death when poisonous doses have been swallowed.

Gentianæ Radix is a simple bitter tonic. Its mode of acting on the system is the same as that of *Calumba* (which see). It has been supposed to exert some slight stimulating effect upon the liver. Few remedies will give such good results in

the *vomiting of pregnancy* as the infusion, combined with a mineral acid ; it will often stop retching when other remedies fail, and it is a feeble laxative.

R. *Inf. Gentianæ Co.* ʒviiss.
Acid. Hydrochlor. Dil. ʒiv. *Misce.*

Fiat mist. cpt. coch. i. mag. ter in die ex paululo aquæ.

Glucosi Syrupus finds its place in the B.P. owing to its valuable physical qualities as a pill-excipient. Commercial glucose (dextrose or grape-sugar) is a mixture of maltose, dextrin, dextrose, and water, and is prepared from starch. Murrell advocates its use as a most valuable food in wasting diseases in daily doses of 1 oz. It may be given by the rectum, and it has been recommended in sterile solution as a hypodermic injection in *shock* and *hæmorrhages* used in place of saline solution.

Glusidum.—Though this drug has had very extensive trials in various diseases, it has at length found its place in medicine as a mere sweetening agent in conditions such as *diabetes, obesity, dyspepsia, cystitis, eczema*, etc., where sugar is contra-indicated. It has antiseptic powers, but not in ordinary doses, and it passes out of the system by the urine unaltered.

Glycerinum is slightly nutrient, and is present in most fatty foods ; it has been substituted for cod-liver oil, but there is no proof that it possesses any of the valuable properties of that drug. In large doses it causes red coloration of the urine, from transudation of the colouring matter of the blood. It may be used to sweeten the unsavoury food of *diabetics* ; and in large doses it is laxative.

Externally, it is emollient when applied to the skin, but often when undiluted it acts as an irritant. By keeping the part to which it is applied continually soft it cures *fissures* and prevents *excoriations* ; with borax it forms the most satisfactory application to *chapped nipples* and *stomatitis*, and can be used in the *aphthous* state so common about the *genitals* of badly-cared-for female children. It prevents *bed-sores*. Applied on cotton-wool to the *os uteri*, and kept in contact, it causes a copious watery discharge, diminishing rapidly any congestion which may be present. Plugs inserted into the nostrils in a similar way may benefit *hay fever*.

Applied to the mouth and throat it relieves the distressing dryness of these parts in prolonged *feverish* states, and it relieves *reflex cough* and irritability of the fauces. It may be given for *hæmorrhoids*, in teaspoonful doses, to which a little chiretta is added to destroy its intense sweetness. The injection of a drachm of glycerin into the rectum by a suitable

syringe is now much used as a means of moving the bowels in chronic constipation ; it is at best a temporary expedient, and aggravates the malady in the long run. The suppositories are a very convenient method for causing an evacuation. If piles be present they may be greatly irritated. Glycerin is a powerful antiseptic, a 10 per cent. solution in water preserving animal substances from decay. It is useful in *dyspepsia*, especially in the fermentative variety. Squire recommends a solution of 15 grs. isinglass in 1 oz. glycerin for various skin diseases.

Glycyrrhiza has demulcent properties, and is used to relieve cough and promote *expectoration*. It is chiefly used for its pleasantly sweet taste. Fresh liquorice root is slightly laxative. The fluid extract covers the unpleasant taste of many nauseous drugs, and the compound powder is only of value on account of the senna it contains.

Gossypium is employed for its physical qualities—softness, elasticity, etc. It affords a protective covering for *burned* and *blistered* surfaces, and is used as a padding for splints, and in *rheumatic fever* as a covering for the inflamed joints. In *phlegmasia dolens*, applied in a *thick* layer over the entire limb, and most completely surrounded with mackintosh, or oiled silk, and bandaged carefully so that the natural moisture cannot evaporate, the writer has found it to be the best of all treatments. *Gouty inflamed joints* are best treated in the same manner.

Granati Cortex is a valuable astringent in the *dysentery* and *diarrhœa* of hot temperatures, owing to the large amount of tannin contained in it. In large doses it kills the *tape-worm*, and 2 ozs. decoction every two hours for four doses, followed by a brisk purge, will prove a good remedy for this troublesome parasite. Many authorities maintain that it is the best of all remedies. The drug itself acts in large doses as a cathartic. Best results are obtained by using the tannate of pelletierine, which see in the Non-Official section of this volume. In very large doses pelletierine acts like curare, paralysing the ends of the motor nerves without influencing sensation.

Guaiacum once held a high position as a remedy for *syphilis*. The only effect certainly known to follow its administration is that of a mild diaphoretic and emmenagogue. Sawyer gives 10 grs. of the resin before breakfast for *amenorrhœa*, and 1 dr. of the ammoniated tincture every two hours in *dysmenorrhœa*. It seems to have some power in relieving the wearying pains of *chronic rheumatism*, and it was an important constituent in the famous "Chelsea Pensioner"—an electuary consisting

of the following, and found useful in the rheumatic and gouty complaints of old people :—

(CHELSEA PENSIONER.)

R. *Guaiaci Resinæ* ʒj.
Sulphuris Sublimati ʒij.
Pulveris Rhei ʒss.
Pulveris Sinapis ʒij.
Potassii Nitratis ʒss.
Mellis vel Theriacæ q.s. *Misce.*

Fiat electuarium, st. ʒi. mane nocteque.

The ammoniated tincture of guaiacum has been strongly recommended as a gargle (1 in 60), and at the same time given internally, in *acute tonsillitis* in $\frac{1}{2}$ dr. doses in sherry. The mixture and powdered resin are better preparations.

Hæmatoxyli Lignum.—Logwood is an astringent, acting like tannin. No other drug except tannalbin is so efficacious in the *diarrhæa of tubercular ulceration* and the inveterate *diarrhæa of childhood*.

R. *Tinct. Kramericæ* ʒij.
Tincturæ Opii ℥lxxx.
Pulv. Cretæ Arom. ʒiss.
Decoct. Hæmatoxyli ad ʒiv. *Misce.*

Fiat mist. cpt. coch. i. min. post singulas dejectiones liquidas.

Hamamelis is a reliable astringent, which seems to possess some claim to have a remote action. In *epistaxis*, *hæmatemesis*, *hæmoptysis*, *hæmaturia*, *menorrhagia*, and especially in *hæmorrhage from piles*, it has checked bleeding. In what way it acts is by no means certain, as it is not very rich in the ordinary astringent principles—tannin, etc. It acts both locally and constitutionally, but it is chiefly for its local action that it is most used. 1 part of the tincture, with 10 of water, makes a lotion for *wounds and ulcers*, or an injection for bleeding or ulcerated *piles*, which can be easily retained. It also is used in *gonorrhæa*, *leucorrhæa*, etc. In all cases it is well to administer it internally at the same time, in 5 min. doses of the liquid extract of the leaves, 3 or 4 times a day. *Hamamelis* is not toxic, and no very definite action upon the vascular system can be demonstrated by experiment. It seems to act upon the muscular fibres in the coats of the veins. It has been extolled as a remedy in *dysmenorrhæa*, relieving pain and languor and producing a comfortable feeling of exhilaration. Brunton found it in some cases of *hæmoptysis* to be more efficient than either *ergot* or *digitalis*. The writer has used it as a local application to *varicoceles* and *varicose veins* with apparent success in some cases, and as an *enema* (1 oz.

hazeline, 2 ozs. water) in bleeding hæmorrhoids, or injected into the bladder in *hæmaturia* from villous growths.

Hemidesmus is supposed to act like sarsaparilla. It is a feeble stimulating diaphoretic, and is used as a remedy for *kidney diseases* and *syphilis* in India. Possibly the fresh plant has some power, for the dried herb seems to have none, and its retention is a blot on the B.P.

Hirudo.—Leeches are used to extract blood in local inflammations, and healthy specimens may be calculated to remove 2 drs. each. They should be applied when possible over such prominences as will permit of a gentle pressure being applied in case of excessive hæmorrhage from their bites. In applying leeches they should never be touched by the fingers of the nurse or attendant. The physician should order the dispenser to send them in a perfectly clean chip box, which should only be opened as the selected part is exposed, and the inversion of the box (which should be gently pressed against the skin till they fasten) is all that is generally necessary. The part should be very clean, and free from all traces of soap, mustard, etc., and if the leeches refuse to bite, which is seldom, a little sugar or cream, or, better still, the minute scratch of a needle, ensures their biting. They should not be pulled off after their feast, but should be allowed to drop; if, however, it is necessary at any time to remove them, a little salt sprinkled over their backs acts as a brisk emetic, and they drop off at once.

Should further bleeding from the bites be required, a hot poultice or fomentation may be applied, or a cupping-glass may be put over the bites; this latter is an excellent plan for the extraction of a moderate amount of blood. A pad of wool or gentle pressure with the fingers will easily restrain the hæmorrhage; but occasionally perchloride of iron must be used, or even a hare-lip needle, with a figure of 8 thread, may be required. Adrenalin or puff-ball will, however, answer all purposes.

In various local inflammations relief often follows the application of leeches, as in *ear troubles*, *pericarditis*, and *meningitis*.

The extraction of blood by leeches should not be recommended in extensive inflammations, for if the system is to be affected it can only be by opening a large aperture and *rapidly* removing a fair quantity of blood in a short time. By the *absolute* rejection of venesection, therapeutics loses a valuable remedy. The writer has twice seen life apparently flow in as the blood ebbed out. It is in cases of *engorgement of the pulmonary vessels*, following severe chest injury, and threatening imminent suffocation, that by boldly opening a large vein in the forearm life will be saved. He has followed this course

in a hopeless case of *submersion*, where death was apparently rapidly approaching. The systemic veins and pulmonary circulation were engorged, and the burdened right ventricle threatened momentarily to cease its almost ineffectual contractions. By making a *free* incision into the median basilic the inspirations became gradually slower, and the heart, eased by the relief of the systemic circulation, commenced to beat strongly, the patient appeared to be suddenly snatched from death, and made a speedy recovery. In such a case death would probably have occurred from suffocation, even had the patient's body been covered with leeches.

Recent investigations, with an extract made from leeches, show that it prevents the coagulability of the blood, and prevents its putrefaction. It has been suggested to inject it in *clot* or *thrombosis*, or to add it to blood before transfusion. The extract also so stimulates the leucocytes and adds to their voracity that it has been seriously suggested as a means of producing immunity to various microbic diseases.

Homatropine acts like atropine and produces mydriatic effects, weaker, but preferable to those obtained by that drug. Discs or a few drops of a (4 grs. to 1 oz.) solution dilate the pupil and paralyse accommodation, the paralysis disappearing in 24 and the dilatation in 48 hours ; whilst the effects of atropine generally last for several days. It increases the intraocular tension, but not so markedly as atropine. Cocaine can be combined with it. It has been used internally in cases where atropine is indicated, as it is less poisonous.

Hydrargyrum.—The soluble salts of mercury are powerful germ destroyers, and to this action most of the effects of the drug are to be attributed. In its metallic state mercury was formerly employed in very large quantities to open the bowels in *constipation* and *obstruction* by mechanically driving the contents before it as it gravitated towards the anus.

Inhaled as a vapour, or used as a fumigation, the metallic mercury is active, as it also is when mixed with inert substances like chalk, and confection of roses, lard, etc., whether swallowed, rubbed into the skin, injected hypodermically, or applied endermically, and all its salts produce marked constitutional effects. If only a minute quantity be administered, and for a short time, there will be an increase in the number of the red blood corpuscles, a general improvement in the circulating fluid, and an increase of body-weight. If the minute doses be indulged in for a longer period, or if the quantity be increased, the blood loses in fibrin and red corpuscles, and becomes charged with excess of waste products ; a brassy taste is felt in the mouth ; the gums swell, and are marked with a blue line ; the teeth are tender ; the salivary secretion is increased ; and fetor of the breath is noticed.

The spongy gums soon ulcerate ; the salivary glands enlarge ; and as the metal is eliminated, it stimulates all the glandular apparatus—cutaneous, salivary, intestinal, and renal—by which it is thrown out ; nervous tremors and disorders of co-ordination appear ; emaciation, prostration, and finally death will occur. These symptoms follow the prolonged administration of any preparation containing the metal in a free or combined state in small doses.

The *inhalation* of mercurial fumes, as seen amongst mirror makers and others, often produces symptoms confined to the nervous system. This form of chronic mercurialism is known as “Mercurial Palsy.” There is tremor of the muscles of the extremities and head, not unlike *paralysis agitans*, and sometimes erethism and delirium have been noticed.

Calomel, mercurial chalk, or blue pill are the preparations usually administered when we wish to get the physiological effects of mercury ; the red iodide and corrosive sublimate are also used, though they are violent irritants. The salts of mercury are dissolved in the stomach or intestines, and find their way into the blood as albuminates, where they are held in solution by the chloride of sodium and excess of proteids, and in their passage out exhibit their selective action, chiefly on the salivary glands, but mercury is thrown out by all the excretory organs, and appears in the urine and fæces, also in the milk, perspiration, and bile.

Exaggerated ideas of the dangerous results of mercury upon the system have arisen, probably because in disease the use of the drug had been generally pushed too far. We know now that it is entirely unnecessary to produce the above effects in order to treat a disease by mercury, and it is evident to those who closely watch the effects of mercury upon children that they will improve and grow fat upon it even for a long time, if judiciously administered.

Internally, mercury has been generally given (1) to combat the poison of syphilis, (2) to control acute inflammation, and (3) to cause the absorption of inflammatory products.

There are, moreover, various groups of symptoms for the dispersion of which mercurials are used. The *diarrhœa of adults and of children* often yields to minute doses— $\frac{1}{10}$ gr. of calomel every hour. The effect of the drug in these cases is probably explained by its action as an intestinal disinfectant. A group of symptoms, known popularly as *biliousness* in the adult, is frequently dispersed by a good dose of calomel or blue pill, which, by removing all sources of irritation in the intestines, relieves an overloaded liver, or remedies a catarrhal condition of the bile ducts ; calomel acts as a purgative—not by stimulating the liver to secrete more bile—but by irritating the duodenum, so that the bile is swept down the canal before time is allowed for its absorption. There is thus really less

bile circulating with the blood after a dose of calomel (which causes free purgation) than there was before. The colour of the motions after calomel is explained by Cushny on the theory that the drug prevents the decomposition of the bile by the microbes always present in the intestines.

Few now advocate the use of mercury in *acute inflammations*, excepting in the case of *iritis*, and it is seldom employed to cause the absorption of effused products, though it is strongly maintained by a few that it controls *meningitis*, and assists the absorption of fluid effused within the cranium. In *meningeal inflammations* of a tubercular nature, after effusion has occurred, if the system be *rapidly* brought under the influence of mercury, such improvement follows as to lead one to believe that a partial absorption of fluid had resulted. In *simple meningitis* the writer has been fortunate enough to witness unmistakable results.

Calomel acts in 5 to 8 gr. doses as a powerful diuretic in *cardiac dropsy*. Leech saw 10 pints of urine passed in one day after its administration. Serious symptoms have, however, been noticed even after 3 grs. three times daily for two days.

In *typhoid fever*, large doses early in the disease are used by Continental physicians to curtail its course. The red iodide in minute doses is vaunted as a specific in *scarlatina*, *diphtheria*, and the perchloride in *cholera*.

MERCURY IN SYPHILIS.—With the recent discovery of the spirochæta which is the causal germ of syphilis the action of mercury in this disease is removed from the realm of pure empiricism into that of scientific therapeutics. The drug, no matter how administered, comes into contact with the protozoon organism causing the disease, and effects its destruction in the blood and tissues. Hutchinson believes that many cases of indurated *chancre* treated early by mercury never show any of the characteristic symptoms of the secondary stage, and when these do appear they are milder than in cases where the mercury had not been used.

Justus has demonstrated that the drug is carried by the blood to the syphilitic lesion, and is stored in the plasma cells as albuminate. He has also proved that the drug forms a soluble compound with the hæmoglobin of the red discs injured by the syphilitic poison, and that the cells become disintegrated. There is a sharp fall in the hæmoglobin percentage a few hours after the drug has been administered to syphilitic patients, which is followed by a rise above its previous standard.

The administration of mercury is injurious in the soft spreading sore. In true indurated chancres, the mercurial should be commenced as soon as possible, and continued till thickening and induration melt away. Marked ptyalism and

the other constitutional effects of the drug should never be produced, but small doses of the non-irritant preparations—calomel, as in Plummer's pill, or grey powder—should be steadily administered, and their use suspended upon the appearance of changes in the gums, or any increase of saliva being observed. 1 gr. of calomel, with quarter this quantity of opium, or 2 grs. of blue pill, or $\frac{1}{15}$ gr. of corrosive sublimate twice a day; or 5 grs. Plummer's pill, or 2 to 3 grs. grey powder, three times daily, will be found enough. Milner contends that the green iodide is the best preparation, especially in light-haired and irregularly living patients.

This method of *continuous* treatment is usually known as that by "tonic" doses in contradistinction to the *intermittent* plan where large doses are administered for shorter periods.

Excellent results follow the method of *inunction*, even when the ordinary administration by the mouth has failed. The results obtained at Aix-la-Chapelle amply prove this, and the writer has satisfied himself that doses can be tolerated there which would produce disastrous effects at home. Patients at a place like Aix, going for a specific purpose, will regulate their life as they will not at home, and, moreover, there is the influence of climate which probably aids elimination of the metal. The German ointment (1 part of Hg in 3) is decidedly superior to our stronger B.P. preparation. 38 grs. may be rubbed in twice daily. The inunction method in selected tertiary cases, as in eye affections and testicular enlargements, is the best treatment where the iodide of potassium fails, as it often will, in effecting a permanent cure. Whilst mercury was always known to fail in the removal of the late tertiary or quaternary manifestations of syphilis, in which stages the living germs of the disease were believed to have perished, the recent discovery of spirochætæ in the margins of the syphilitic tertiary lesions in apes should lead to a prolongation of the period of treatment of the disease by the drug.

The method of *fumigation* by a spirit lamp and calomel is troublesome and uncertain.

The *hypodermic* method is much used on the Continent— $\frac{1}{4}$ gr. of the bichloride in $\frac{1}{2}$ dr. of water. 30 injections in as many weeks into the gluteal muscles are said to effect a cure. 1 gr. of yellow oxide, or of calomel, suspended in vaseline oil or weak mucilage, may be similarly employed. Grey Oil contains 40 per cent. mercury. It is made by mixing 39 parts of mercury, 2 of mercurial ointment, and 59 of vaseline oil: of this 1 to 2 grs. may be injected daily. All these preparations are liable to cause abscess, and the perchloride solutions always cause pain. (See under Non-Official Remedies.)

Mercury is seldom given by the *rectum* or *endermically* unless for its local effects.

Recently the *intravenous* injection of mercury has been carried out successfully by Lane and others, who inject 20 mins. of a 1 per cent. cyanide of mercury solution into the most prominent vein below the elbow.

Mercurial treatment, as a rule, should be continued for at least one year, and at short intervals for another year, and it is a good general rule to prohibit marriage for three or four years. The administration should be discontinued for a time, or the dose materially lessened, on the appearance of the physiological effects of the drug.

In *congenital syphilis* there is no preparation equal to grey powder, which may be given freely, as mercury in moderate doses seems almost incapable of doing harm whilst there is a large amount of the syphilitic poison for it to expend itself upon. Weak, emaciated infants bear larger doses when poisoned with syphilis than they can when afterwards apparently cured and fattened; but if, after a period of neglect, syphilitic symptoms come on markedly, then they bear very large doses again. A child half a year old may get $\frac{1}{2}$ gr. grey powder three times a day for three days, then $\frac{1}{2}$ gr. every night, and this may be continued as long as the infant thrives. If no result seems to follow, a little of the ointment may be rubbed in occasionally.

The *corrosive sublimate* is the most poisonous of the mercurial compounds, causing violent purging, collapse, and death in a few hours when taken in large doses. It is the most powerful destroyer of germ life, and has been used with advantage internally and locally in a host of septic conditions. In *surgical* and *obstetric* practice, *diphtheria*, *gonorrhœa*, *tinea*, and numerous other ailments, its local application, with or without its internal administration as well, is beneficial. Considering the infinitesimal quantity of this substance necessary to form a solution which will *hinder* the growth of anthrax bacilli—viz., 1 in 1,000,000 (while 1 gr. in 5 gallons of water will *entirely prevent* the growth), it is easy to realise the enormous benefit which may be obtained from its disinfecting qualities without endangering the system by the action of the drug. The introduction of solutions of corrosive sublimate for washing out the vagina and uterus in lying-in hospitals has been followed by the lowering of the death-rate; but its indiscriminate use has already led to many serious cases of poisoning. 1 in 5,000 is quite strong enough for ordinary solutions. It may be prescribed with iodides advantageously.

R. *Hydrarg. Perchloridi* gr. ij.
Potassii Iodidi ʒij.
Aquæ Destillatæ ʒxij. *Misce.*

Fiat mistura, st. ʒss. ter in die post cibos.

Externally, *Ungt. Hydrarg.* is used to produce the constitutional effects of mercury upon the system, by being rubbed into the skin. The following are a few of the uses of the different mercurial ointments which are applied for their local action :—

Ungt. Hyd. Subchlor. relieves the painful *itching* of various *eczematous* conditions about the genitals and anus ; it is a valuable application to *all* indolent *syphilitic skin diseases*, and rarely causes salivation. Metchnikoff has demonstrated that a 30 per cent. calomel ointment rubbed into the site of a syphilitic inoculation within an hour after the introduction of the virus on the glans penis of an ape and also of a human subject entirely prevented the formation of a primary sore, and prevented syphilis.

Ungt. Hyd. Ammon. acts as a poison to vermin, and readily destroys pediculi and their ova, and is used to kill the parasites which cause *tinea*, etc. It is invaluable when combined with tar in *chronic scaly eczema*.

Ungt. Hyd. Co. and *Liniment. Hyd.* are used as substitutes for Scott's dressing. Spread upon lint, and applied with pressure around *diseased joints* and *glandular enlargements*, they are useful by stimulating the lymphatics.

Ungt. Hyd. Iod. Rub. is an active rubefacient, seldom used in this country except in veterinary practice, where it produces absorption of bony outgrowths and tumours. It is a powerful remedy for *goitre* in India, when aided by the rays of the sun.

Ungt. Hyd. Nitrat. Dil. acts as a stimulant to the scaly stage of *eczema*, and in some way alters the action in the diseased skin, often after every other remedy fails. It is invaluable in inveterate *ozæna*, when diluted with glycerin and brushed inside the nose. The undiluted ointment has been successfully used to abort *whitlows* and *boils* by thickly spreading it over the inflamed part and covering with plaster.

Ungt. Hyd. Ox. Rub., diluted with eight times its weight of lard, or, preferably, *Ungt. Hyd. Ox. Flav.*, is an invaluable stimulant and alterative in obstinate *conjunctivitis* and *eczema of the eyelids*, and is a substitute for the popular "Golden Ointment," but it must be most carefully triturated. (Pagenstecher's ointment of the yellow oxide is double the B.P. strength.)

Ungt. Hyd. Oleat. is unstable and unsatisfactory.

Unguentum Metallorum is the name given to a mixture of equal parts of ointments of oxide of zinc, diluted nitrate of mercury, and acetate of lead, much used in *chronic eczema*.

Lotio Hyd. Nig. and *Flav.* are stimulating applications to various *chancroid* and other sores of a specific origin. Their efficacy leads one to suppose that they act by destroying the syphilitic poison as they come in contact with it.

Liq. Hyd. Nitratis is a powerful caustic, indicated in the treatment of *syphilitic warty growths* and *scrofuloderma*.

A solution of the perchloride (5 grs. to 1 oz.) is used to destroy the *parasites of various skin diseases*.

Hydrastis.—The study of the actions of the partially antagonist alkaloids of hydrastis cannot be said to have thrown much light upon the doubtful and variable therapeutical actions of the crude drug. Thus berberine, though causing motor paralysis in frogs and rabbits, merely acts as a bitter tonic in man. Hydrastine stimulates the spinal motor centres like strychnine, causing tetanic convulsions, which are followed by paralysis. It acts as a muscle poison affecting both varieties of muscle fibres after a primary stimulation, in which the heart, uterus, respiration, and intestines are all exalted in their functions. Moderate doses raise the blood pressure by constricting the arterioles, both by direct action on their fibres and through the vaso-motor centre. Canadine exists in very small amount in the root, and its action need not be considered. The rhizome has been extolled in *catarrhal conditions of the gastric surface*, especially in those following alcoholic excess; it has occasionally proved valuable in the vomiting of pregnancy. It is believed to benefit catarrhal conditions of all mucous membranes, as in *bronchitis*, *pharyngitis*, *otorrhœa*, *leucorrhœa*, *cystitis*, *gonorrhœa*, *hæmorrhoids*, etc., a weak infusion of the drug, or a solution of the fluid extract, 1 in 20, acting still more potently when locally applied. It arrests *uterine hæmorrhage*, and many observers testify to its controlling *metrorrhagia* and *menorrhagia*, reducing *fibroids*, and in relieving *metritis*. It has been recommended wherever ergot is indicated; it does not cause painful uterine contractions, but *hydrastinine* is more reliable for this purpose. This is an alkaloid allied to cotarnine, which is artificially formed by the oxidation of hydrastine; it acts like hydrastine, but does not affect the nerve centres unless in very large doses. Its effect upon the blood pressure and the arterioles is much quicker and stronger than that of the rhizome or its alkaloids, and it is believed to influence the uterine fibre as well as the muscular tissue in the uterine bloodvessels. It may be given in uterine and other hæmorrhages in doses of $\frac{1}{2}$ gr., by the mouth or hypodermically; it does not depress the heart, and has been recommended as a cardiac tonic and stimulant, acting somewhat like strychnine. It has been given with success in *epilepsy*, where it is believed that it depresses the cortex cells. Locally applied, hydrastinine dilates the pupil.

Hydrogenii Peroxidi Liquor is a powerful, non-poisonous oxidising agent, giving off large amounts of free oxygen on contact with organic tissues. It thus becomes a potent antiseptic, in some respects rivalling even corrosive sublimate,

and it is practically harmless. 1 of the pure peroxide in 100,000 will prevent the growth of germs in bouillon, and the official liquor will sterilise 1,000 times its bulk of very impure water. It destroys organised ferments with avidity, but has no effect upon enzymes, and does not precipitate albumin.

When injected hypodermically or into a vein, large quantities of free oxygen are given off, and death may result from air emboli; but by the mouth it is not poisonous. It is an antidote in poisoning by Prussic Acid.

Coming into contact with pus, brisk effervescence results owing to the liberation of oxygen, germs of all kinds are destroyed, and by its mild stimulating effect a new action is set up in the suppurating tract which leads to rapid healing. In cavities like the pleura and peritoneum, and in large psoas abscesses, free egress must be provided, otherwise enormous distension may result, and air emboli may gain an entrance into the circulation. Diluted with an equal amount of water, it forms a valuable dressing for *ulcers*, *venereal sores*, and *abscesses* of all kinds; half of this strength may be applied to the throat in *diphtheria* and foul conditions of the mouth and throat. 1 of the solution in 8 of water may be freely applied to the urethra, eye, nose, and ear as an injection, spray, or swab. It bleaches the colour of hair effectually, and in various forms has been used as a cosmetic; and it is credited with hæmostatic powers in *epistaxis*. It has been successfully used for the removal of gunpowder stains.

Internally, it has been recommended in a host of ailments with the view of acting as an antiseptic and supplying a more abundant supply of oxygen to the blood, but its utility is very doubtful in these cases; nevertheless it has some reputation in *pneumonia*, *fetid bronchitis*, *pertussis*, *scarlatina*, *diabetes*, *epilepsy*, and *phthisis*.

Ozonic Ether is the name given to a solution of hydrogen peroxide in ether which has been given in drachm doses in the above-named diseases. Peroxide of hydrogen is the basis of the disinfectant known as Sanitas.

Peroxide of Sodium is a white powder used for stopping and bleaching decayed teeth; it forms hydrogen peroxide on the addition of water.

Hyoscyami Folia.—This drug affects the system like *bella donna*, producing delirium, dryness of the mouth, dilatation of the pupil, and sleep. It differs from it in being more decidedly hypnotic and less stimulating to the heart, and in its sedative influence over the urinary mucous membrane. Small doses are sedative and tonic to the heart; large doses excite, whilst excessive doses depress it; hence it has been used in *cardiac asthma* and excitement of the heart from valvular lesions. In all the *spasmodic* affections in which *belladonna* is useful

it may be employed. In inflamed and irritable conditions of the *bladder* it is valuable. The active principles of the drug are mildly *diuretic*, and in passing out of the system exert their sedative influence upon the terminal nerves of the irritated membrane; and it is especially indicated when the bladder is contracting frequently, to expel small quantities of urine unnecessarily. It may be advantageously combined with alkalies in these cases.

Children bear enormous doses of hyoscyamus, whilst the *aged* are seriously affected by even small quantities. It corrects the painful griping of purgatives, increases peristalsis, and relieves the pain of *internal neuralgic affections*. The juice in teaspoonful doses is the best preparation.

Rx. *Tinct. Hyoscyami* ℥iss.
Liquor. Potassæ ℥iv.
Ext. Pareiræ Liq. ℥ij.
Infus. Buchu ad ℥viij. *Misce.*

Fiat mist. st. coch. i. mag. quater in die ex paul. decoct. hordei.

Hyoscinæ Hydrobromidum is more poisonous, and differs materially in action in some points from atropine, with which it is so closely allied chemically. It has a powerful sedative and hypnotic action, and the stimulating effect produced by atropine on the heart is absent, and the cortical motor cells of the brain are depressed. After the $\frac{1}{120}$ gr., drowsiness, languor, and calm, apparently natural sleep soon supervene, and the patient wakes up feeling well, only some dryness of the throat remaining for a time. It is the best hypnotic in *mania*, and the various forms of mental disease. The drug acts best by hypodermic injection, but as some patients are very susceptible to its action it is well to begin with a dose not exceeding the $\frac{1}{200}$ gr. It produces in rare cases wild delirium like that seen in atropine poisoning. It rapidly and powerfully dilates the pupil (1 in 2,000) like atropine, being at least 4 or 5 times stronger in its action, and the intra-ocular pressure is not obviously increased.

Krauss states that after its administration the maniac collapses as if struck by lightning, but that the calming down of the general paralytic is gradual, his restlessness soon settling into peaceful slumber. In *delirium tremens*, *puerperal mania*, and various forms of *insomnia*, it has proved valuable. In *insomnia*, where there is a latent element of insanity, it is the best known hypnotic. Bruce finds that it acts well where the kidney is diseased, and it may be given in *angina pectoris*.

It has been used ($\frac{1}{250}$ gr.) in *paralysis agitans* by Erb, and the writer has witnessed most unmistakable relief from it in this condition when given by the mouth in doses of less than

$\frac{1}{250}$ gr., which may be gradually increased. It has proved successful in *asthma*, *seminal emissions*, in the *sweating of phthisis*, and in the treatment of morphia and cocaine habits.

It has been used to produce general anæsthesia by Schneiderlein, who injects about $\frac{1}{100}$ to $\frac{1}{200}$ gr. with $\frac{1}{4}$ gr. morphine the evening before operation, this being repeated, if necessary, in larger dose upon the morning of the operation. Volkmann's method is similar, the doses being somewhat smaller.

Hyoscyaminæ Sulphas is the soluble salt of another alkaloid obtained from *hyoscyamus* leaves. There are still many points to be settled about the action and dose of this substance.

It has been employed in *insomnia*, *mania*, *delirium tremens*, *paralysis agitans*, *asthma*, *neuralgia*, and *chorea*, but it would seem with less benefit than hyoscine. It seems to resemble atropine more closely in its action than hyoscine does, but in the majority of cases it produces sleep without the preceding delirium. Ringer, who possibly administered an impure salt, reports that he compared its effects in acute mania with atropine, and could not observe any marked difference. It is a powerful mydriatic, and is used in ophthalmic practice, but possesses no advantage over atropine. A. R. Cushny has demonstrated that pure hyoscyamine is twice as powerful as pure atropine in dilating the pupil and checking the salivary secretion. It is the best *preventive of sea-sickness* if taken for a few days in $\frac{1}{100}$ gr. doses before embarking, and repeated every hour or two for a few times should symptoms of nausea appear. It is also used as a mydriatic and as a remedy to control the tremors of *paralysis agitans* and mercurial palsy, but it is inferior to hyoscine for these purposes.

Iodoformum, whether swallowed or slowly absorbed from wounded surfaces, produces disturbance of digestion, loss of appetite, malaise, vertigo, rapidity of pulse, insomnia, increase of temperature, and cerebral disturbance, not unlike some forms of alcoholic intoxication, passing into hallucinations, melancholia, collapse, and in a few instances death. These symptoms may come on suddenly without warning if the salt has been applied to a large surface; the temperature may rise to 104° ; delirium, mania, and coma may set in, and speedy death may ensue. Moorhof says that symptoms of poisoning never occur if the drug be used alone, and no other antiseptics be employed with it. Bicarbonate of potash acts as an antidote in poisoning by iodoform.

Experiments prove that *in the laboratory* germs will live in a 50 per cent. solution, but it is equally certain that *even weak solutions coming in contact with pus at the temperature of the body* become powerful germ destroyers. Many authorities deny the antiseptic action of iodoform, and strongly recom-

mend that before it is used it should itself be sterilised by heat—they affirm that it does good, not by killing germs, but by exciting new action in the tissues. Binz found that fat and ptomaines set its iodine free, and this substance, he thinks, produces the therapeutic and toxic action of the drug; but this cannot be accepted without reserve, since the peculiar intoxication noticed is never caused by free iodine—in all these cases unchanged iodoform in the blood is answerable for the mental symptoms, whilst grafted upon these are the symptoms of iodine poisoning. Cushny points out that the acceleration of the heart and some other symptoms are produced by the abnormal activity of the thyroid secretory cells. Many skin eruptions appear during its application, and severe dermatitis is apt to arise if the dressings containing it are covered with oiled silk, and especially if carbolic preparations are used at the same time.

Iodoform is freely excreted by the pulmonary surface and kidneys, appearing as iodine in the urine, and though containing 96·7 per cent. of nascent iodine, it does not produce the irritant symptoms of even small doses of that drug. It is for its antiseptic properties that iodoform is used in surgery; dusted in fine powder over *sloughing sores, chancres, buboes, bed-sores*, and *cancers*, it prevents decomposition and excites healing. The stench of cancerous discharges from the vagina and rectum is instantly removed by the use of a pledget of lint soaked in 1 dr. iodoform to 1 oz. glycerin. A solution of 1 in 12 of flexible collodion may be painted over *syphilitic sores*.

Iodoform is a local *anæsthetic*, weakening sensation in the parts to which it is applied as carbolic acid does; the official suppository causes the sensation to be much blunted after its introduction into the rectum or vagina.

A bougie containing 10 per cent. of iodoform, with eucalyptus oil and cacao butter, has been used in *gonorrhœa*.

The B.P. ointment may be used for all ordinary sores, whilst 10 to 20 grs. to 1 oz. may be applied in *ophthalmia*; 1 to 4 may be used for *granular lids*. Its anodyne and antiseptic properties render it a remedy of great value for *burns*, where the gauze soaked in glycerin and water and covered with cotton-wool can be used with benefit.

It has been vaunted as a remedy in *phthisis*, but has fallen into disuse; it has no power over the tubercle bacilli, and the sprays, inhalations, and inunctions are now abandoned. The method of injecting into basilar and tubercular cavities in the lung is also falling into disuse, though its value as an agent in the treatment of tubercular abscesses in other parts is beyond doubt. Barling extols injections of about $\frac{1}{2}$ oz. of a 10 per cent. glycerin emulsion into or around tubercular joints, whilst others with success inject a mucilaginous

emulsion into the joint cavity. Coumarin or Tonquin bean, musk, coffee, Peruvian balsam, and turpentine cover its nauseous odour.

Iodum in the free state is a powerful antiseptic, and externally is a valuable counter-irritant, weak solutions causing mild rubefaction, whilst the liquor will sometimes vesicate. Weak solutions are absorbed when applied to the skin, and finding their way into the tissues stimulate the absorbent vessels, and thus aid the removal of *glandular swellings* and *pleuritic effusions*. The drug can always be found in the urine of patients so treated. Equal parts of the liquor and tincture is the best form for application. The liquor applied in its strength is found to cause changes of position in the corpuscular elements under the skin, but any effect produced by it is not owing to its absorption, but to its counter-irritant qualities. It has been found useful in chronic *glandular enlargements*, in various painful affections of the *thoracic* nerves and muscles, and, painted in the neighbourhood of small *local inflammations*, it often arrests the suppurative process and prevents the growth of *boils*. The liquor will destroy the parasites in *tinea* and other skin diseases.

One part of the tincture in 50 of water is used to wash out *cysts* in which putrefactive changes are going on ; and diluted with an equal bulk of water, or alone, the tincture is injected into the serous cavity surrounding the testicle to excite adhesive inflammation and work a radical cure in *hydrocele*.

The vapour of iodine is used for inhalation in chronic suppurative *bronchial* affections. The tincture (15 mins.) injected into *solid bronchoceles* and enlarged *lymphatic* glands causes their absorption. Durante's method of treating surgical tuberculosis by injections of iodine has given splendid results.

Iodine is a powerful irritant poison, producing violent vomiting, purging, giddiness, convulsions, syncope, and death ; hence in the free state is not often used internally, since iodide of potassium possesses nearly all the properties of the metalloid, without the disadvantage of causing gastric irritation. Dr. S. B. Coates reports marked benefit in the treatment of *lumbago* and *muscular rheumatism* by 3 or 4 min. doses of the tincture in fresh mucilage and water. The salt is inferior to iodine in the treatment of *scrofula*, and iodine produces results in *malaria* where iodide of potassium is inert. Granville uses it in *gout*. Liq. Iodi Co. (Lugol's Solution) consists of 5 per cent. of iodine dissolved in 10 per cent. iodide of potassium solution.

Since *Iodide of Potassium* or of *Sodium* is the form in which iodine is generally prescribed internally, its use will here be referred to. The sodium salt is preferable. Given to a

healthy man in small doses, it improves the appetite and increases the weight of the body. It is rapidly absorbed, and probably remains as iodide of sodium in the blood; and if the dose be increased, and taken frequently, a characteristic group of symptoms is developed, to which the name of *iodism* is given. A brassy taste is felt in the mouth, the amount of saliva is increased, and there soon appear signs of irritation of the mucous membranes of the eye, nose, throat, and bronchial passages, resembling an ordinary catarrh, with swelling of the eyelids; the brows and teeth ache; eruptions like acne, purpura, or urticaria appear; appetite fails; nausea and diarrhœa come on; waste increases, causing emaciation, debility, and a sinking feeling at the bottom of the sternum; sexual power is weakened or lost, and the urine becomes increased, a well-marked cachexia follows, and tuberculosis may supervene. All the glandular organs of the body are stimulated to increased activity, and the drug has been said to cause wasting of the mamma and testicle. In some the symptoms of iodism cannot be produced, as patients have been known to take 2 drs. or more daily for many months. It is eliminated by the kidneys, salivary glands, bronchial membrane, and mammary glands; and Binz believes that whilst being eliminated, and also whilst being carried to the different tissues of the body, *free* iodine is given off, which produces all the effects of the drug. In this way the irritation of the eye, nose, and bronchial membranes is produced, and the eruptions are probably produced by the elimination of the free iodine by the glands of the skin. He has demonstrated by a simple experiment that when *living* protoplasm is brought in contact with iodides in the presence of carbonic acid free iodine is always given off.

It should be remembered that some patients cannot take even the smallest dose of this drug without suffering from alarming iodism. The writer has many times witnessed the remarkable phenomenon pointed out by Brunton, that patients who took 1 or 2 grs. with great inconvenience ceased suddenly to have any trouble as soon as the dose was quadrupled.

It is invaluable in many *scrofulous* states, causing the absorption of various *effused unhealthy products*, either by increasing the activity of the absorbents or by rendering such products more fluid. In this latter way it acts upon the secretion of *chronic bronchitis*, and thus becomes one of the best of expectorants. The products of *pleuritis*, *pneumonia*, and *pericarditis* often yield to moderate doses (5 grs.), and it is the best remedy for the early stages of *cirrhosis of the liver and lungs*. Schmidt has used it with success internally, along with the local application of cold to *goitres*. It is a strong anaphrodisiac and antilactagogue, diminishing the secretion

of milk satisfactorily in 10 gr. doses. Upon its elimination by the kidneys it acts as a powerful diuretic.

Full doses are said to cure *erythema* in the first few days, and it has been given with success in *psoriasis* in very large doses, but its liability to produce serious skin eruptions should not be lost sight of.

In *chronic rheumatism*, *gonorrhœal rheumatism*, and *rheumatoid arthritis* it gives good results, often relieving the wearying pains, and promoting the absorption of effused products.

In large doses (20 grs. and upwards) iodide of potassium has been used for the treatment of *internal aneurisms* beyond the reach of surgery. It probably acts upon the coats of the diseased bloodvessel, and may effect alterations in the physical qualities of the blood ; it also leads to fibrinous deposition and solidification. It may give marked relief to the wearying pains caused by aneurismal growths without exercising any cure, and it gives good results in *angina*.

Germain Sée and Laborde maintain that it acts like digitalis as a true cardiac tonic, and the writer has obtained splendid results with it in *aortic valvular disease*. The researches of Stockman and Charteris prove that the drug, even in large doses, does not reduce arterial tension.

In *chronic metallic poisoning* the iodide of potassium entering the blood, meets with the albuminates of mercury or lead stored in the tissues, and by forming soluble salts, which are eliminated, the system is purged of the poison.

In a somewhat similar way iodide of potassium combines with the specific poison in *tertiary syphilis* and decomposes it. Its power over new growths, the result of syphilitic deposit, is rapid and certain ; *gummata* melt before its influence, and *bony enlargements* of a specific origin are often speedily reduced, but it must in such cases be given boldly in doses of 20 to 40 grs. Some physicians push the drug in such cases to the extent of 1 oz. in 24 hours, and Seguin states he has given 2 drs. thrice daily to patients between 4 and 8 years old without any bad results ; this line of treatment he speaks of as the " American." The physician will seldom meet with cases where such doses are necessary. The effects of the drug in *syphilis*, though marked, are not lasting or curative, unless mercury be combined with it.

The same result is occasionally noticed as was mentioned about mercury in congenital syphilis—*i.e.*, after the apparent destruction of the specific poison the system is less tolerant of the drug. It appears to possess little influence over the earlier stages of syphilis. Gowers insists upon the injury which long courses of the drug produce, but the writer has known large doses to be taken for many months without ever noticing any symptoms of injury.

It speedily relieves *bronchial asthma depending upon simple catarrh*. It is perhaps the best routine remedy in asthma when pushed. It acts occasionally as a powerful but uncertain diuretic.

The treatment of *hydrocephalus* by iodide of potassium has many advocates, and though it appears to have some control over the amount of fluid poured out, still evidence is not forthcoming to prove that it has any curative influence.

Half a grain, with 10 minims of hippo wine, is a valuable tonic given after food. Ammonia increases the effect of iodide of potassium; and when the dose exceeds a few grains it never should be given to a fasting patient.

On page 35 will be found the description of a method by which 6 grs. of the iodide can be ordered in a pill.

Iodine is bleached by Carbolic Acid, and Boulton recommends the following colourless antiseptic for general purposes:—Liquor iodi (B.P. 85) 2 drs., carbolic acid 50 grs., hot water 20 ozs. Dr. J. Wilson finds that 40 mins. of the liquor, 8 mins. of carbolic acid, and 32 mins. of liquor potassæ, make a colourless liquid (containing 1 of iodine in 18) which is neither caustic, vesicant, nor irritant. For colourless Tincture of Iodine the B.P.C. formula for Tr. Iodi Decolorata may be used.

Ipecacuanha was formerly employed as a counter-irritant, owing to its power of producing a pustular eruption. The active principle (*emetine*) is a powerful poison. Large doses of the powdered root cause vomiting—*directly*, by acting upon the peripheral extremities of the pneumogastric in the stomach; and possibly also *indirectly*, by stimulating the vomiting centre; this effect is produced either by the hypodermic injection of the alkaloid, or by its internal administration. When administered hypodermically the vomiting is long delayed and uncertain, but marked irritation of the gastro-enteric membrane has been found; this is considered evidence by many authorities that the drug has no centric action, but is simply excreted by the stomach and bowel, which it irritates. Its emetic action is too slow to be of use in poisoning, but it is highly beneficial in *croup* and *bronchitis* in children. In smaller doses ($\frac{1}{2}$ gr.) ipecacuanha acts as a direct stomachic, increasing the vascularity of the stomach, and promoting the flow of gastric juice, and, combined with the same quantity of iodide of potassium, we have one of the best remedies for *atonic dyspepsia*. Still smaller doses (1 min. of the wine), Ringer affirms, will cure the vomiting of various conditions, as *pregnancy*, *alcoholism*, *migraine*, etc., though many believe any action following such dose is due to suggestion. In larger doses (3 to 5 grs.), the powder acts as a diaphoretic,

but is uncertain unless when combined with opium—as in Dover's powder—and it is remarkable that the combination is so efficacious, only a grain of either remedy being in each dose, whilst much larger quantities of each, separately, are so uncertain. In diaphoretic doses it also acts very markedly upon the *bronchial* mucous membrane, causing free secretion of thin mucus, hence its valuable expectorant qualities. The tough secretion of *chronic bronchitis* is thus rendered more fluid, and comes up with greater ease to the patient; whilst in acute attacks the dry inflamed membrane is soon covered over with a moist secretion.

Rossbach demonstrated the expectorant powers of emetine upon the exposed tracheal membrane, acting like apomorphine in *bronchial catarrhs* and *laryngitis*. It is especially indicated in inflammatory affections of the bronchial membrane in children, assisting the expulsive action and diminishing the adhesiveness of the secretion, its *diaphoretic* effect in these cases being also beneficial.

In *winter-cough* there is no remedy more efficacious than ipecacuanha, and a spray of equal parts of the wine and water has been successful in Ringer's hands.

The writer, in conjunction with Dr. Workman, made a series of experiments on the action of various remedies upon the cilia of the bronchial mucous membrane. Though a weak solution of ipecacuanha succeeded oftener and more effectually than any other remedy in restoring the movements after their cessation, the results were far from satisfactory or conclusive.

Ipecacuanha has been given in nauseating doses in various *hæmorrhages* with uncertain results. On the liver this remedy acts as a stimulant, and it slightly increases the intestinal secretion.

In *dysentery*, in the acute stage, it possesses powers which are deemed almost specific; it should be given in doses of at least 20 to 60 grs., and the stomach seldom rejects it if absolute rest be enjoined and liquids sparingly swallowed. Merck has introduced a deemetinised preparation, *i.e.*, ipecac. without any emetine in it, for dysentery. In *acute pneumonia* doses equally large have been given with good results. It has some influence over *whooping-cough*; as an emetic the wine may be given in teaspoonful doses every 15 minutes to a child one year old, or 5 mins. may be administered every hour in *bronchitis*, as in the following:—

R. *Vini Ipecacuanhæ*
Syrupi Scillæ ana ℥iii.
Liquor. Ammon. Acet. ℥j.
Aquæ Chlorof. ad ℥iv. *Misce,*

Fiat mistura. Cpt. coch. min. secundis horis.

Jaborandi and Pilocarpine act as powerful sialagogues and diaphoretics. After the hypodermic injection of $\frac{3}{4}$ gr. of the nitrate of the alkaloid marked results follow in a few minutes. There is flushing of the face and neck, beads of perspiration appear on the skin of these parts and rapidly extend over the body, and soon the entire cutaneous surface becomes bathed in profuse perspiration, which may pour in streams for more than an hour from the patient, saturating his garments or soaking the bedclothes. Saliva at the same time commences to flow, and it becomes also very profuse. Other secretions are augmented—the tears, bronchial and nasal mucus, gastric and intestinal juices, the cerumen from the ears, the urine, and, if a female, the milk, and uterine and vaginal mucus are increased. The bloodvessels dilate as seen by the throbbing carotids, the pulse quickens, and the patient seems warm; soon, however, with the full establishment of the perspiration, he feels cold, and shivers, the pulse slows a little, while the blood pressure rises and finally falls. The pupils contract, and the accommodation becomes tense; vomiting and painful forced micturition occur. As the effects pass off, the pupils may dilate, and the patient feels sleepy and exhausted, and if put in the balance may sometimes be found to have lost as much as 7 lbs. in weight. The salivation and perspiration are the result of a stimulant action on the peripheral terminations of the nerves of the salivary and sweat glands; the lachrymal, bronchial, gastric, and intestinal pancreatic and other secreting glands are similarly affected. The contraction of the pupil is caused by the irritation of the peripheries of the third nerve, and follows also its local application.

The spleen, uterus, bladder, and intestinal muscular fibres contract owing to the stimulation of their nerve endings, and the peristaltic movements are markedly increased in the stomach and intestines. With large doses the heart fails through paralysis of the endings of the vagus, which are at first stimulated, as is seen in the slowing of the cardiac contractions. The bile is not increased; the drug is eliminated by the kidneys, but not by the skin. The respiration is scarcely affected. Sometimes collapse and alarming prostration speedily follow the hypodermic injection of even $\frac{1}{4}$ gr.

The effects of pilocarpine resemble those produced by muscarine, and are antagonised by atropine, and it fails to produce salivation and sweating if this latter drug has been previously administered. Atropine should be promptly injected if alarming symptoms show themselves during the use of jaborandi or its alkaloid, but the effects of atropine are not so readily antagonised by pilocarpine, both as regards the drying up of the saliva and the stimulation of the heart.

Pilocarpine has been applied locally to the eye in *glaucoma*, *intraocular hæmorrhage*, *iritis*, and *retinitis*, and good results

sometimes follow its hypodermic administration in *detachment of the retina*.

In *uræmic coma* and *convulsions* the hypodermic use of $\frac{1}{4}$ gr. will sometimes save life by the rapid elimination of urea and other products by the perspiration. The writer has pointed out that the danger of the drug causing œdema of the lung in these cases is prevented by only administering it after the patient's skin has been powerfully stimulated in the hot pack. In Bright's disease the hypodermic injection of the alkaloid, or 10 mins. of the liquid extract by the stomach, give good results by diminishing blood and albumin and increasing the amount of the urea. In the same way it diminishes *anasarca*, and by stimulating the kidneys assists in the removal of *pleural* and *peritoneal* accumulations. In *bronchial* affections it produces most marked effects, even blocking up the tubes by the profuse secretion which it creates, but it does not achieve anything which apomorphine and ipecac. will not perform without the serious drawback of its action upon the skin and saliva (see page 327). Nevertheless it has been used in *asthma*, *pertussis*, *bronchitis*, *tonsillitis*, *laryngitis*, and *diphtheria*; in *diabetes*, *amenorrhœa*, *uterine* affections, *syphilis*, in poisoning by *atropine*, and in chronic poisoning by *iodine*, *arsenic*, *lead*, and *mercury*; and in skin diseases, as *prurigo* and *urticaria*. Under its use the hair has been noticed to grow rapidly, and it has been given to cure *baldness*; it may be applied externally to the scalp, but best results follow hypodermic injections into localised areas of baldness. Hypodermic injection will relieve ordinary *toothache*, and enlarged glands have been reduced by injecting the drug into their centres.

Small doses ($\frac{1}{25}$ gr.) are beneficial in the sweating of *phthisis*, and large doses ($\frac{1}{2}$ gr.) cause contraction of the *uterus*, and may induce labour. Josham has found that $\frac{1}{3}$ gr. hypodermically has most remarkable sobering powers in *drunkenness*, and a similar daily dose has been given to increase the secretion of the mammary glands.

Rose Bradford points out that in transverse lesions of the spinal cord the level of the lesion may be determined for diagnostic purposes by administering pilocarpine, as the sweating which follows is always most marked in those regions of the skin which still remain in organic connection with the grey matter from which the sweat nerves are derived.

Jalapa and its resin are powerful hydragogue cathartics, acting, like scammony, entirely by their *local* irritating effects upon the intestine, as injection into the circulation has no effect upon the bowel. The drug must come in contact with the bile to be efficacious; the extract and resin produce considerable pain and griping; the compound powder will

be found the most satisfactory form for administration, and it is especially in *anasarca* and *ascites* that it is indicated. It may be given in 1 dr. doses, stirred up in a tumbler of water, or swallowed dry in wafer-paper. The resin is less bulky and less nauseous than jalap, and may be given in 4 gr. doses, in pill.

Juniperi Oleum.—A mild stimulant and stomachic in small doses. It rapidly enters the blood, and is picked out by the kidneys, which it powerfully stimulates, carrying with it increased quantities of water if *dropsy* exist, whilst in health it may even diminish the quantity of water. It excites the *genital organs*, and seems to resemble turpentine and cantharides when given in very large doses, as strangury and priapism have been known to follow its use. The spirit makes a good addition to diuretic mixtures, and may be used as a substitute for gin when added to alcoholic liquors.

Kaolin is chiefly used as an excipient for pills containing permanganate of potassium, gold and silver salts, made into a mass with a little vaseline. Purified by elutriation and grinding it forms a dusting powder for *intertrigo*, *weeping eczema*, *impetigo*, etc., as in the various forms of allied prepared Fuller's Earth.

Kino is a powerful astringent, containing nearly $\frac{3}{4}$ of its weight of tannin; it acts like it, and is useful in *diarrhœas*, *hæmorrhages*, *relaxed throat*, or when the effect of tannin is desirable. The compound powder is an excellent preparation, combining with the astringency of kino, the narcotic effects of opium. It resembles in its action both catechu and krameria.

Kousso. (See Cusso.)

Krameria.—Rhatany is a valuable astringent and tonic, resembling kino and tannin in its action. 5 grs. of the extract and $\frac{1}{4}$ gr. morphine made into a suppository are valuable in *fissure* and *prolapse of the anus*; and a teaspoonful of the tincture in a wineglassful of water makes a valuable wash for *spongy gums*, *relaxed throat*, or *mercurial stomatitis*; or the following may be used:—

R. *Tinct. Krameriaë*
Tinct. Myrrhæ
Tinct. Cinchonæ
Tinct. Kino ana $\mathfrak{zj}$. *Misce.*

Fiat mist. $\mathfrak{zj}$. ex $\mathfrak{z}i$. aquæ utend. pro lot. oris mane nocteque.

Laurocerasi Folia, though often used as a mere flavouring ingredient, contain hydrocyanic acid, and possess, when taken in sufficient doses, all the powerful sedative properties of that drug. (See Acid. Hydrocyanic.)

Lavandulæ Oleum acts as a carminative like the following ; it is seldom used except as a perfume, and the tincture is used as a colouring ingredient, and enters into Fowler's solution, which undoubtedly would be better borne by the stomach if the lavender were omitted. 5 mins. of the oil on sugar will rapidly relieve *colic*, and it can be given in combination with cajuput.

Limonum.—The oil and rind of the lemon are used in medicine only on account of their flavour, though in 3 to 5 min. doses the oil is a valuable remedy in painful and *irregular contractions of the intestinal tube* caused by accumulations of gas. The aromatic constituent of the oil has been isolated. It is known as Citral, and is used for its flavouring powers, being about 8 times stronger in this respect than the oil.

A decoction prepared by boiling fresh unpeeled lemons, sliced, is regarded as a valuable antiperiodic in *malaria*. The fresh juice has been found to promptly check *epistaxis* when injected into the nostril. (See under Acid. Citric., where the action of the Succus is described.)

Linum.—The seeds contain a mucilaginous principle, which they yield to boiling water, and which acts as a soothing demulcent when it comes in contact with the gastro-intestinal mucous membrane, protecting it from irritating secretions. It has reputed expectorant qualities, which probably entirely depend upon its action on the throat as it passes through on its way to reach the stomach. Large doses of an infusion act as a diuretic by mildly stimulating the kidneys, and a patient with an *irritable bladder* often finds relief from it.

Linum contusum in the form of poultice affords the best medium for the application of continuous moist warmth to *local inflammations*. When a hot linseed poultice is applied to a part, the warmth causes the small vessels to dilate freely ; the muscular elements in the skin, hair follicles, and gland ducts are relaxed, and thus the tissues get soft, and the tight feeling or tension of inflammation is reduced or passes away ; the sensitive nerve endings experience less pressure by the blood being drawn to the surface. A warm poultice to the *inflamed hip joint* sometimes relaxes spasm of the muscles and diminishes the transferred knee pain.

Poultices should be spread upon flannel, and they should be as warm as can be comfortably borne ; a very hot poultice will often aggravate pain and tension by acting as a direct local stimulant.

The question often arises, when should poultices be applied to local inflammations, as in a case of *whitlow* ? If applied early, general relaxation of the tissue is the result, and the tension which is fatal to the life of the part is removed, and

resolution is more liable to occur ; but if inflammation has already progressed so far that the white corpuscular elements have wandered through the coats of the vessels, or a purulent collection has already formed, poulticing assists it materially in reaching the surface. Thus poultices, by making the part an internal one, are useful in *all stages of inflammation* ; if applied early they prevent suppuration, and if used in the advanced stages they hasten or encourage it ; and if an antiseptic quality existed in them, everything that is desired would be achieved. We have this desideratum in the spirit lotion, or boric lotion, when covered in with oiled silk.

The oil is laxative, but is seldom given except as an enema. Externally, it is a favourite application to burns, when made into an emulsion with lime water, constituting "Carron Oil."

Lithium salts in large doses act as muscle poisons, profoundly depressing the heart and stopping respiration ; in medicinal doses they act like salts of potassium, over which they possess the advantage of forming *more soluble salts with uric acid*. The urate of sodium, which exists so largely in the system in *gout*, is converted into the more soluble biurate of lithium, which acts as a diuretic as it is eliminated by the kidneys. This result follows the use of either the carbonate or citrate, the latter being changed into the former in the system ; and a solution of the carbonate ($1\frac{1}{2}$ dr. to 1 pint) has been found useful by Garrod for removing the *chalky deposits of gout*. The prolonged administration of lithium salts will dissolve uric acid calculi in this way, hence they are called lithontriptics, but many authorities deny any such power to them on the grounds of their extremely diluted condition in the blood after ordinary medicinal doses ; and Haig maintains that their administration lessens the elimination of uric acid in the urine.

The effervescing citrate is an agreeable form for administering the drug. Up to 1 oz. of it may be taken daily.

Lobelia in large doses is a dangerous narcotico-acrid poison, like tobacco ; it excites vomiting and purging, depresses, and finally paralyses the respiratory centre and peripheral endings of the vagus in the heart, and causes intense prostration, giddiness, and complete muscular relaxation, causing death through its action upon the respiration. It is seldom employed except in *asthma* and *bronchitis*. It possesses two very decided actions—it is a powerful antispasmodic and expectorant, but as a rule little benefit is to be expected from its use till nausea supervenes, by which time its depressant action on the respiratory centre is established.

10 mins. of the B.P. tincture may be given every hour for 3 or 4 doses till nausea is experienced, but it is better to follow Ringer's plan of small doses frequently—3 mins. of the

tincture every 15 minutes as soon as the attack of asthma comes on till relief be obtained.

There is no reason why the antispasmodic effects of lobelia may not be intensified by narcotics, and the combination with opium, morphine, or preferably chlorodyne, will give satisfactory results. It can be given with advantage in *catarrhal asthma* along with apomorphine, or with iodides in full doses.

Small doses sometimes relieve *spasm* of the *bowel* caused by faecal accumulations. It increases the action of the skin and kidneys, acting as a diaphoretic and diuretic.

R. *Tr. Lobeliae Æther.* ʒiv.
Spt. Ammon. Aromat. ʒvj.
Tr. Chlorof. et Morphinae Co. ʒij.
Syrupi Pruni Virg. ad ʒiij. *Misce.*

Fiat mist. cpt. ʒi. tertiis horis p.p.a. ex aqua.

Lupulus.—Hop is an aromatic bitter, increasing the vascularity of the gastric membrane, aiding digestion and promoting appetite; by its slight narcotic action it promotes sleep in various *irritable* or *delirious conditions*. When made into a pillow, to rest the head upon, it tends to induce drowsiness, probably acting by suggestion. It is largely owing to the hop contained in them that malt liquors possess tonic properties. A bag filled with hops, dipped in very hot water, makes an agreeable fomentation in *colic* or *local inflammation*. Lupulin, in 5 gr. doses, is the best form for administration.

Magnesium, like calcium, is a constituent of the normal body. When the oxide or carbonate is administered by the mouth, a portion is dissolved by the gastric juice and absorbed; the residue passing down the bowel is converted probably into bicarbonate of magnesium, and, acting like the sulphate, though much more mildly, it purges or acts as a laxative. Most of the oxide passes out unaltered in the faeces. The antacid properties of magnesia are serviceable in *acid dyspepsia* and *heartburn*, whilst tastelessness and freedom from acrid qualities, in large doses, make it a favourite *purgative* for *children*. Gregory's powder is a valuable antacid laxative tonic. Magnesia can be given in 2 dr. doses in milk or lemonade. This latter increases its purgative qualities. The carbonate, by giving off carbonic acid in the stomach, has local sedative qualities not possessed by magnesia. 32 grs. of light calcined magnesia will absorb about 1 quart of CO₂, hence its great value in some forms of flatulence. The oxide is a valuable antidote in poisoning by the mineral acids, by arsenic and by copper and mercurial salts. The *Liquor Mag. Carb.* is an agreeable and mild purgative, not liable to lead to the formation of concretions of magnesia in the colon as the lighter powders are prone to do. Like lime salts, it is

useful in acute and chronic *urticaria* in the adult, and for the various forms of *nettle-rash* in infancy and childhood. It may be combined in these cases with tincture of rhubarb.

Magnesii Sulphas is the most certain and safe of saline purgatives. It acts not by increasing peristalsis, as Thiry supposed, but by causing increased secretion of fluid, and retardation of absorption. Hay, who has demonstrated the action of this salt, found that it produced copious intestinal secretion according to the amount of the dose and the strength of the solution. The low diffusibility of the salt prevented the absorption of the secreted fluid, and thus between retarded absorption and stimulated secretion a large amount of serous fluid accumulated in the bowel until the quantity of liquid amounted to about what would be necessary to form a 5 or 6 per cent. solution of the salt. (The accumulated fluid is of the nature of a true succus entericus, and not an inflammatory exudate, though Kuchanewski maintains that it is a transudate from the intestinal capillaries.) The peristaltic action of the bowel was but slightly increased, and this increase was owing to the distension caused by the large collection of secreted fluid. The sulphate was split up, and the acid, being more easily absorbed than the base, disappeared partially from the small intestine, to return, however, shortly afterwards. Meanwhile, the base (magnesia) was gradually undergoing absorption, but never pursued the same peculiar course of absorption and excretion as did the acid. In this way Hay explains the remarkable fact that one-fourth of a purgative dose, if injected into the veins, will cause death, but when swallowed the salt is split up in the canal, the toxic or basic part entering the blood so gradually that it has time to be excreted by the kidneys. These important results were obtained with phosphate and sulphate of sodium and sulphate of magnesium. It was that portion of the salt *which remained within the bowel* that caused the secretion of intestinal fluid, and not the portion absorbed into the blood. When the salt was injected into the blood directly, purgation did not follow, but rapid poisoning by profound depression of both heart and respiration soon supervened. The fluid accumulated in the intestine after the administration of sulphates of magnesium and sodium at the expense of the fluid part of the blood, which afterwards recouped itself from the fluid of the various tissues. The weaker the solution of the salt administered, the less fluid was extracted; and if less than 5 per cent. solution were swallowed, no increase in the intestinal secretion from the blood occurred. If, however, a *very* concentrated solution were given, and the canal were quite empty, and no water were swallowed before or after a dose, a profuse pouring out of intestinal secretion, and subsequent concentration of the

blood, soon followed ; thus, after fasting, a large dose (say 1 to 2 ozs. sulphate of magnesium dissolved in its own weight of water) will cause almost as free depletion as if the lancet were used.

In this way in *dropsies* and in the removal of large *serous accumulations* excellent results are obtainable ; the rapid withdrawal of so much serous fluid from the blood being speedily followed by the extraction of large quantities of the transuded fluid from the areolar tissue or peritoneal cavity.

The recent experiments of Hertz, Cook and Schlesinger support the theory of Aubert that the salines only act *after absorption*, being carried by the blood to the colon where they exercise their cathartic action. The X rays showed the saline after absorption reaching the cæcum long before bismuth oxide given at the same time. Evidently the last word has not yet been said about the pharmacology of Epsom salt.

Sulphate of Magnesia is used as an antidote in *lead poisoning*, the metallic salts being changed into the inert sulphate which is evacuated by the bowel through the purgative action of the magnesia.

Wyatt-Smith states that the drug in the form of white mixture is a specific for *tropical dysentery* when given in full doses, a plan of treatment known as the "Evacuant Method."

Many of the natural mineral waters contain sulphate of magnesium, most of them also contain sulphate of sodium, and are popular remedies for *portal congestion*, occasional *constipation*, *gout*, and *obesity*.

The carbonate may be well combined with the sulphate, and if administered in peppermint water, constituting the hospital Mist. Alb., makes a palatable and efficacious purgative, suitable in many diseased conditions. The Mag. Sulph. Efferves. is a very good preparation.

Sulphate of Magnesia has been administered hypodermically (2 grs.) by Fincke and Luton, who report that it causes purgation, though this is denied by others. J. Wood maintains that this result is owing to its paralysing the inhibitory power of the abdominal nerves, thus permitting a free flow from the intestinal glands, while Hay maintains it can only act as a counter-irritant by causing pain and inflammation. The practice is not to be recommended. Injected by the intraspinal method the drug has been used to produce anæsthesia and to remove the spasms of *tetanus*.

Manganese Salts are supposed erroneously to act somewhat after the manner of iron. They are used in *amenorrhæa*, *gastrodynia*, and *anæmia* by some, though Stockman maintains that they are quite useless in anæmia and chlorosis. The black oxide is merely introduced into the B.P. Appendix for making chlorine. When injected into the circulation man-

ganese salts are highly toxic. Kobert found that the paralysis of reflex action which resulted was produced by the destruction of the transverse conducting power of the cord. Death resulted from respiratory depression. For the action of Permanganate of Potassium see under Potassium.

Mel Depuratum is seldom used in medicine, except as a vehicle for more active remedies. In large doses it acts as a mild laxative. It has been praised for its expectorant qualities, which, if they exist, are probably owing to its local effect upon the throat and fauces. Externally, honey has been used as a protective application to boils and *excoriations*. Its efficacy in *aphthous* states of the mouth entirely depends upon the borax with which it is associated. It has antiseptic properties like sugar. Oxymel is used as a *cough syrup*, and probably its action is purely local.

Menthæ Piperitæ Oleum and **Menthæ Viridis Oleum** are rapidly absorbed into the system, and behave as mild diffusible stimulants. Coming into contact with the gastric mucous membrane, they exercise at first a stimulating and afterwards a local sedative or *anæsthetic* effect, dispelling *nausea* and correcting *uneasiness*. They correct the irregular painful sensations caused by accumulations of *flatus*, giving speedy relief, probably through a reflex act by driving onwards imprisoned gas. In a somewhat similar way the *gripping* of *cathartics* is obviated. 3 to 5 mins. of the oil may be given on a little powdered sugar, and repeated every hour.

Externally, when applied undiluted, these oils produce *anæsthesia* and *relieve the pain of superficial neuralgias* and *herpes zoster*, and possess powerful antiseptic properties which have been useful in *diphtheria* and *phthisis*. When their external use is desired the following drug is usually selected :—

Menthol is a powerful antiseptic and local *anæsthetic*. When applied to the skin it destroys sensation, producing numbness without corrosive action, and thus it relieves when painted over the course of painful nerves, as in *neuralgia*, *sciatica*, and *pleurodynia*; it diminishes the itching in *eczema*, *lichen*, and *pruritus ani*. The sensation of cold is believed to be produced by the action of the drug upon the special nerves of temperature. It relieves *toothache* when applied to the carious cavity, and is a parasiticide when applied to various skin diseases. A 20 per cent. solution in olive oil has been applied with a syringe in *laryngeal* and *tracheal tubercle* with good results, its *anæsthetic* effects being cumulative, so that Rosenberg found, after a few injections, that the *anæsthesia* lasts 24 hours. It appears to possess the power of aborting *boils*, *whitlows*, and *glandular abscesses* when applied locally. Internally it acts like camphor, and has also expectorant qualities.

Mezerei Cortex is used now only as an irritant ; when applied externally it causes inflammation of the skin and raises the cuticle like cantharides, though uncertain and slow in its action. It has diuretic properties, and was at one time supposed to act as an antidote to the poisons of *syphilis* and *rheumatism*, and to be useful in *inveterate skin diseases*. It should be removed from the B.P.

Morphine. (See under Opium.)

Morrhuaë Oleum is the most easily digested of fats, and possesses very high nutritive qualities ; it is therefore to be regarded mainly as a food and not as a drug. Its great efficiency as a restorative agent in *wasting diseases* depends to some extent upon its power of aiding the assimilation of other foods which would not be absorbed except in its presence. After meeting with the pancreatic juice and bile it readily emulsifies and enters the lacteal vessels, and it appears to have the power of bringing along with it the oily and nitrogenous elements of the food. Digestion is thus considerably facilitated, the blood corpuscles are augmented, the weight of the body is increased, and a stimulus is given to healthy cell formation, which to some extent depends upon fat supply. It is a valuable expectorant, and Brunton believes, in *bronchitis*, that it acts by nourishing the newly-formed cells, which otherwise could not take on the character of mucous cells.

The great utility of cod-liver oil in *wasting diseases* is beyond dispute, and often its effects are decidedly curative in some forms of *chronic phthisis*, and in conditions like *scrofula*, *syphilis* and *rickets*, depending upon defective nutrition or errors of assimilation.

By directly supplying fat, which is an important element in the composition of the nervous system, cod-liver oil is beneficial in *nervous exhaustion* and *neuralgia*, and hastens repair in various structural and functional affections of the *nerve centres*.

The chemical constituents found in cod-liver oil have been regarded as affording an explanation of its value in increasing the weight of the body and combating disease ; but the mere traces of bromine, iodine, and phosphorus are too insignificant to account for its action, the traces of biliary matter contained in cod-liver oil may assist the absorption of the oil and hasten its passage through animal membranes, but this is absent in the pale oil. The fatty acids present, especially in the dark oil, aid in its emulsification and absorption, and so does cholesterin. (See under Morrhuaol.)

The writer found as a result of carefully weighing the subjects of disease under a course of cod-liver oil that they *increased considerably more than the weight of the oil taken by them*. Sidney Martin has drawn attention to the fact that the

deposition of fat following the use of the oil is more evanescent than that which supervenes when ordinary fatty food is indulged in. The oil causes the absorption and assimilation of food elements not usually finding their way into the lacteals, and it nourishes the body independent of its own highly nutritious qualities. The many diseases for which this remedy appears to act as a specific depend upon some deep-seated error in assimilation, which is removed by the continued use of this valuable food. Hence the slowness of its action in cases of *chronic rheumatic arthritis, lupus, psoriasis*, etc.

Cod-liver oil should not be given in febrile conditions, nor in irritable nor catarrhal affections of the stomach and intestines. *Phthisis*, accompanied by high temperature, is not benefited by it, but a slight degree of fever should not prevent its administration if the digestive organs are healthy; and if in such cases an effervescing mixture of the bicarbonate of potassium with lemon juice be given with a minute quantity of morphine for three or four days *the oil will be often relished afterwards*.

No advantages follow the mode of giving cod-liver oil in very large doses, except that the surplus quantity generally acts as a mild purgative, but it often upsets the stomach and causes slight congestion of the liver. Drachm doses will be found enough to begin with, afterwards $\bar{\text{v}}$ iv. may be given *ter in die*, and it is a good rule to confine its administration to bed-hour for the first few days. It should always be given about 1 to 2 hours *after a meal*.

Various plans are suggested to cover its taste, but it is probable that the efficacy of the oil is diminished by the saponification and chemical changes which it undergoes in producing many of the so-called emulsions. The combination with extract of malt is a valuable one.

It can be emulsified by gum acacia or tragacanth, and flavoured with cinnamon, lemon, or bitter almond. This latter is the best, but, as a rule, it is advisable to begin with the oil in small doses, and leave the vehicle to the taste or caprice of the patient, who may try water, milk, coffee, wine, orange juice, beer, punch, etc., according to fancy. Some patients can swallow the oil without any trouble, but the unpleasant eructations afterwards cause intense discomfort. In these cases the addition of any flavouring ingredient is a mistake, and the only preventive (if the patient can tolerate it) is to hold the oil in the mouth for a time, and cause it to be thoroughly mixed with saliva by moving the tongue round the inside of the cheeks. Where this can be tried, the oil will be found to rapidly digest.

When no method can be found by which the oil is retained in the stomach, then recourse must be had to inunction; 4 or more drs. should be rubbed into the skin after a hot bath,

and there can be no doubt that good often follows this practice. *The process of inunction is of the greatest use in the wasting diseases of children.* After about 1 tablespoonful is well rubbed into the skin of the abdomen, a deep flannel binder should be put on. This in a few days becomes saturated with the oil, and should be covered with as much thin mackintosh as will surround the body. The inunction should be repeated twice a day, and the flannel should be changed not oftener than once a week.

The writer is satisfied that by the persistent and intelligent application of the oil in this manner surprising results may be obtained. Hypodermic injection of the oil is recommended, but rectal administration is better where the oil cannot be tolerated by the stomach.

Moschus is a diffusible stimulant and antispasmodic. It has enjoyed some reputation in low *febrile* and *typhoid states* with great nervous *excitement*, followed by *prostration* and collapse. It acts as a stimulant to the respiratory centre. It has also been used in *hysteria* and in various disorders supposed to be of spasmodic origin. The dose (10 grs.) costs so much that the use of the drug is now practically confined to cases of such gravity that there is little opportunity given to test its questionable properties, and moreover it is often much adulterated.

Myristica.—Nutmeg is a well-known aromatic stomachic, chiefly, however, used for its agreeable flavour. In small doses (10 grs.) it acts as a stimulant to the stomach by increasing the flow of the gastric juice, aiding digestion and promoting the desire for food. In the same way it acts further down the canal by dispelling accumulations of gas, and relieving *colic* and *spasm*. In large doses it is a *powerful and even dangerous narcotic*, acting upon the cerebrum and producing symptoms like those following poisonous doses of camphor—viz., vertigo, giddiness, and coma.

Myrrha is a carminative, and possesses the power, in common with other gum resins, of stimulating mucous surfaces, and astringing their relaxed condition in disease: thus *bronchial catarrh* and *chronic cystitis* are improved, and it appears likewise to relieve *leucorrhœa* and diminish excessive secretion from the *cervical mucous surface*. Its reputed emmenagogue properties rest upon very questionable foundation. Good results have been reported from tincture of myrrh in diseases like *diphtheria*, especially where there is mixed infection. Stroll (Munich) treated 80 cases with only one death. He gives the following mixture every hour in $\frac{1}{2}$ to 4 dr. doses:—Tincture of myrrh 1, glycerin 2, water 47 parts. Binz has demonstrated that myrrh causes increase in the leucocytes, and the theory of its action is that it stimulates phagocytosis.

Locally, myrrh has a very beneficial tonic action upon *diseased mucous surfaces*, and may be applied to *spongy gums* and *aphthous conditions of the tongue* (see R. on page 410). *Foul ulcers* are likewise benefited by it.

Naphthol.—In small quantities beta-naphthol is fatal to low organisms of all kinds, and at the same time can be given safely to the human subject. Bouchard affirms that this substance is the best known intestinal disinfectant, and that it would require $\frac{1}{2}$ lb. to kill an adult weighing 130 lbs., whilst 40 grs. will produce intestinal disinfection. Nevertheless its free use may cause fatal nephritis in the human subject, especially if the kidneys are diseased, and Brunton states that when absorbed it causes vomiting, loss of consciousness, and hæmaturia. It has been used with success as a gastric disinfectant in cases of *pyloric obstruction*; but unpleasant eructations are liable to follow its administration in this condition. It may be combined with salicylate or other salt of bismuth. In *typhoid* fever Bruce believes that it shortens the duration of the attack and lessens the risk of complications; and many other authorities corroborate his conclusions. It must be given in cachets, as it is insoluble in water.

Its action upon the skin resembles that of tar, and it was for this that it was introduced into medicine. Kaposi used it in *eczema*, *psoriasis*, *scabies*, *chronic ulcers*, etc. His ointment consists of beta-naphthol 1 dr., lard 1 oz. It has been likewise used as a gargle in *diphtheria*, an injection in *leucorrhœa*, *gonorrhœa*, etc., in the strength of 2 to 5 per cent. Ointments for scabies and psoriasis should contain 15 per cent., and for *tinea* 20 to 30 per cent.

Nitroglycerin. (See Trinitrin.)

Nux Vomica or Strychnine acts as a powerful protoplasmic poison, selecting for its operation certain portions of the spinal cord, whose functions are markedly increased after the drug has been carried to them in the circulating fluid or applied directly in the process of experiment. The first symptoms appear within a short time after the administration of a large dose; there is a sensation of stiffness of the muscles of the body, commencing usually in those of the neck and thorax, which soon spreads to the back and limbs. Severe *tonic* spasmodic seizures supervene; these are heralded by twitchings of various muscles or groups of muscles till the entire voluntary system becomes firmly contracted in one terrible cramp-like convulsion, in which, owing to the greater power of the extensors, the body rests upon the heels and occiput, forming a bow with the concavity corresponding to the powerfully curved spinal column and extended legs. Owing to the brevity of the first spasms they simulate clonic convulsions, but lengthening their dura-

tion as the effects of the drug deepen, these seizures soon prove their true tonic character by lasting several minutes, during which the respiration is suspended, as if the thoracic walls were held in a vice, the result of which is seen in cyanosis or asphyxia. The facial muscles often, by their contraction, cause a ghastly sardonic grin. The seizure suddenly passes off, leaving the patient exhausted, limp, and restless; but a recurrence can at any time be induced by the application of any stimulus such as a smart pinch, a current of cold air, a bright light, or even a loud noise. It is held by most authorities that the spinal cord is incapable of *generating* the true strychnine spasm, which therefore must be considered as essentially a reflex phenomenon. This view receives strong support from the fact that if the posterior nerve roots in the frog be severed, no convulsions occur, and the same result can be achieved by paralysing the sensory nerves by the direct application of cocaine to the skin. If, however, the divided posterior nerve root be stimulated at its centric end, convulsions follow. Cushny points out that the sensory nerves remain practically non-affected by the poison, since, if the strychnine be shut off from a limb by ligature of its artery, convulsions will follow if this limb be pinched or irritated.

The phenomena of strychnine poisoning cannot, however, be fully explained by the simple theory of powerful stimulation of the ganglion cells or their dendrites in the anterior cornua of the cord. The results of experiments prove that the poison diminishes the resistance which, according to Cushny, "normally opposes the passage of impulses somewhere between the point at which the centripetal fibres enter the cord and the motor cells, but does not seem to act upon the motor cells of the anterior horn nor upon those of the posterior root ganglion." He thinks that the drug acts upon some cells intercalated between these structures. In the unpoisoned frog a stimulus to the foot travels along a definite track of least resistance, leading to the movement of the withdrawal of the limb, but in strychnine-poisoning the same stimulus produces the most powerful possible contraction of all the muscles of the body, with the result that the limb is pushed downwards against the site of the applied irritation. This proves that all the paths have their resistance removed, and that after the absorption of the drug sensory impulses, no matter where they enter the cord, pass along every path in it, and cause reflex motor impulses to emerge and affect every muscle in the body.

The cerebrum remains unaffected, except by the result of the impeded respiration; but the cells associated with the function of the special senses, as those of sight, hearing, and smell, are stimulated, and marked activity of these senses is observed; even after moderate doses the field of vision is enlarged, and the perception of shades of colour improved.

The medullary centres are powerfully influenced, the respiratory and vaso-motor being stimulated along with the inhibitory cardiac centre, and the blood pressure is raised. Death usually results from respiratory failure, either due to mechanical causes or to paralysis of the over-stimulated respiratory centre. The voluntary muscles and peripheral nerves are not obviously affected, and the changes found in the cells of the anterior cornua after death are probably due to over-activity, as similar alterations in them follow the electrical stimulation of the muscles.

Much attention has been given to the action of strychnine on the heart, and though experimental data have not demonstrated any considerable increase in the power of the ventricular contractions, there cannot be a doubt of its marked value in cardiac failure, whether due to failing compensation or to the exhaustion arising in diseases like pneumonia or typhoid fever, the powerful cardiac action of the drug being amongst the most certain of clinical results. The arterial pressure, which is increased during poisoning, is explained by the constriction of the vessels, through pressure of the contracting muscles on their calibre, and by the retained carbon dioxide, due to respiratory suspension. In order to demonstrate that the action of strychnine was a chemical one upon the protoplasm of the cord cells, the writer had a series of experiments performed with rabbits, by injecting strychnine intimately mixed with an emulsion of healthy spinal cord; but though a slight antidotal effect was produced, the animals always succumbed to double the fatal dose, no matter how much cord substance was mixed with it.

The symptoms of strychnine poisoning closely resemble those of tetanus, but rigidity does not begin in the muscles of the jaw; the convulsions are *tonic* in both cases, but in tetanus there is absence of the muscular relaxations which give the appearance of clonic contraction in strychnine poisoning. The phenomena after the administration of strychnine come on rapidly, and soon pass off, or are fatal; and there is no history of a wound or operation, as in tetanus.

Owing to its stimulating action upon the reflex function of the cord, strychnine is useful in the treatment of many neurotic affections. In *paralysis* it is valuable, especially in those cases where the loss of muscular power is not great—*i.e.*, *paresis*. In *hemiplegia*, *paraplegia* of *reflex origin*, and in various forms of *local paralysis*, strychnine is the most serviceable remedy we possess; but it should not be given—(1) in recent cases, (2) whilst *rigidity* exists, or (3) in cerebral paralysis with continuance of head symptoms; (4) nor is it of any use where *great* wasting or fatty degeneration of the affected muscles is present, nor (5) where the muscles do not respond to the electric current. It has been beneficially

injected into the muscles in *local paralysis*, but this is regarded as an irrational method, since the only benefit must come from its spinal action.

Various spasmodic diseases are said to be cured by strychnine—*chorea*, *asthma*, and *epilepsy*, though the writer often finds the symptoms are exaggerated by it.

Strychnine acts most beneficially upon the alimentary canal ; being a pure bitter, it increases the tone, motor power, and vascularity of the stomach, improves appetite, and promotes digestion ; and in *atonic dyspepsia* and various *chronic catarrhal affections* of the gastric mucous membrane, it acts as an excellent tonic. Further down the canal its effects are even more marked ; by its stimulating power over the reflex action of the cord, it greatly increases the muscular contractions of the intestinal tube, counteracting *constipation* and *fecal accumulations*, and affording a valuable addition to purgatives. These effects are so marked that occasionally the stools are much altered in size, and may be seen to present the attenuated appearance observed in stricture of the rectum. The following is a good combination :

R. *Tinct. Nucis Vomicae* ʒiij.
Acid. Nit.-Hydrochlor. Dil. ʒvj.
Tinct. Aurantii ʒj.
Inf. Gentianæ Co. ad ʒx. *Misce.*

Fiat mist. cujus cpt. ʒss. mensura ex ʒi. aquæ ter in die ante cibos.

In the same way it proves useful in *prolapsus* of the *anus*, *nocturnal enuresis*, and *atony* of the *bladder*, and has a strong aphrodisiac effect, and is useful in *sexual debility*. Functional *amaurosis* often very rapidly yields to strychnine in $\frac{1}{20}$ gr. doses. By stimulating the respiratory centre it relieves the *night sweats of phthisis*, and is often most valuable in *bronchitis* and *pneumonia*, where the condition of this centre is depressed.

The writer believes that he has upon several occasions saved life in *diphtheritic paralysis* by free hypodermic doses, and in cases of *cardiac failure*, as in acute *failing compensation*, it is the only reliable drug when a rapid effect is necessary ; but its cardiac effects can only be counted upon with certainty when given by the hypodermic method.

Strychnine accumulates in the system by causing contraction of the renal vessels, which prevents its own elimination, and its administration should be carefully watched. The alkaloid is stated to be always excreted unaltered in the urine, but in a case of poisoning where death *almost* resulted, the writer found that the urine afforded not the *slightest trace* of strychnine, though the patient had been convulsed for 7 hours ; the alkaloid appeared to have become oxidised or

burnt up in the system. In this case life was saved by dosage with alcohol in quantities which in health might have proved poisonous.

It is advisable not to begin with a larger dose than $\frac{1}{30}$ gr., which may be gradually increased to $\frac{1}{12}$ gr. 10 to 12 mins. of the tincture of *nux vomica*, or $\frac{1}{2}$ gr. of the extract, will be enough for a fair dose. Death has resulted in man from $\frac{1}{2}$ gr. strychnine. It acts more powerfully from the rectum than if swallowed. Hypodermically it affords relief in *acute peritonitis*.

By its quickening or stimulating effect upon the sensory centres the writer has found strychnine to be generally injurious in various *hysterical* and *nerve ailments* where there is undue irritability of the peripheral sensory fibres, but it is useful in *sea-sickness*.

Strychnine is antagonistic to chloral and alcohol, and the writer believes that *very large* doses of alcohol afford the safest and best hope of success in strychnine poisoning. Since making this statement about the antagonistic effects of alcohol and strychnine in the first edition of this work, many observers have noticed that strychnine is antagonistic to alcohol, and strongly advise its use in *chronic alcoholism*. It is likewise useful in chloral and chloroform poisoning when administered hypodermically. The drug must not be prescribed with alkalies and tannin, and it forms sparingly soluble compounds when prescribed in concentrated mixtures containing iodides and bromides. Brucine, the other alkaloid of *nux vomica*, acts in a similar manner to strychnine, but it is very much weaker. It has given good results in epilepsy and chronic alcoholism. The dose of the hydrochloride is $\frac{1}{4}$ gr. Its solution has also some analgesic power.

The following form will be found convenient for the administration of *nux vomica* in chronic constipation :

Rx. *Ext. Nucis Vomicae* gr. ss.
Ferri Sulph. Exsic. gr. i.
Ext. Aloes Barb. gr. i.
Pulv. Ipecac. gr. i. *Misce.*

Fiat pil. mitte tales xxiv., i. omni vespere sumend.

Olivæ Oleum, in doses of 1 or 2 ozs., produces soft, painless motions, and by its soothing qualities it protects the bowel from contact with irritating secretions, foreign matter, or partially digested food. Thus it is highly beneficial in *constipation*, *inflamed* or *ulcerated hæmorrhoids*, and *fissure of the rectum or anus*; it is especially useful as a laxative in cases where the bowels have been locked up by opium. In small quantities it is a nutritious food. Its hypodermic administration has been advocated.

After 6 oz. doses, 12 hours after the administration of a blue

pill, *gall-stones* are said to have been passed in great quantity, and much larger doses have been administered by some physicians with good results. Pure oleate of soda (known as Eunatrol) is also efficacious.

Externally, the bland, unirritating qualities of the oil have obtained a place for it in liniments, poultices, and ointments, but it causes smarting when applied to the conjunctiva.

Opium and Morphine are practically synonymous as regards their pharmacological and therapeutic actions.

A moderate dose of opium will act upon the alimentary tract from the mouth to the anus; dryness of the lips, tongue, throat, and gullet will be evident in a very short time, secretion being stopped or diminished; gastric juice becomes less abundant, digestion is retarded, and the appetite fails. The intestinal fluids are not secreted as before, and constipation ensues after a time. Arterial tension slightly rises, the pupils contract, and the nervous system is influenced; first, there is a sense of pleasant activity of the cerebral faculties, ideas flow with speed through the mind, and exhilaration bordering upon mild intoxication may be noticed, soon followed by a calm of variable duration, which passes into drowsiness and sleep; often the stage of mental activity is absent, and it is always best marked in those accustomed to the use of the drug, and it can be prolonged by dividing the dose and giving the fractions at short intervals.

Headache, mental confusion, and malaise, with digestive disturbance, often remain after waking.

In fuller doses the above symptoms are present, only in greater intensity; the stage of stimulation is *shorter*, the somnolency comes on swiftly, and soon passes into sleep, with irregular, slow breathing, and, if the dose be large enough, coma supervenes. In poisonous doses sleep comes on so rapidly that the excitement stage is not apparent. The pupils are strongly contracted; the breathing, at first slow and stertorous, becomes feeble and irregular, the face is cyanosed, and the skin cold and moist; the pulse, at first full and strong, becomes feeble and rapid; the coma, at first incomplete, and out of which the patient was easily aroused for a time, becomes more profound, until finally no stimulus appears to arouse the least response, and death occurs from asphyxia, caused by paralysis of the respiratory centre, convulsions sometimes occurring owing to the retained CO_2 . It is noteworthy that true tetanic convulsions (so common in the lower animals poisoned by opium) are scarcely ever seen in man.

Opium checks every secretion in the body except that of the skin and mammary glands.

Only the higher cerebral centres are affected by full doses, but if repeated, gradually the basilar ganglia are influenced.

The spinal cord does not escape, as may be often noticed by the retention of urine following large doses, and the sensory nerve fibres throughout the body are more or less under the spell of opium, for sensibility becomes diminished, apparently by the conductivity of the impressions being less perfect. Brunton found that opium influenced the peripheral terminations of the vaso-motor nerves, and thus diminished or prevented the reflex dilatation of the vessels, which always occurs when local irritation is present. This, he thinks, is the probable explanation of how opium cuts short inflammations.

These two distinct effects produced by opium—*cerebral excitement* in the first instance, and *depression* or sleep afterwards—vary very much in different individuals, and also to some extent depend upon the way in which the drug is administered. Thus, in nervous, excitable women, the first effect may be the only one noticeable, sleep not following; while again a very large dose will likely produce only the second effect, no excitement, or only a momentary flash being observed, sleep quickly supervening. By graduating the dose, the opium-eater can usually avoid the second stage, and prolong the excitement indefinitely. Some pharmacologists maintain that the action of the drug is depressant from the first, the apparent stimulation being due to a primary depression of the higher centres, whose inhibitory action being thus removed, the lower ones act without the normal restriction.

Sleep results from the power of the drug to diminish or depress the functional activity of the cerebral cells, the action being probably the result of a chemical combination between the protoplasm of the cell and the alkaloid, and this view is supported by the recent theory of Myer and Overton that the anæsthetic action of a substance is a function of its solubility in fatty compounds. The extreme contraction of the pupil, characteristic of opium poisoning, is clearly *centric*.

The effects of opium upon the pulse are explained by the action of the drug upon the cardiac motor ganglia, at first causing the slow full beat; this is intensified by the dilatation of the cutaneous vessels. Afterwards the pulse fails from the depression of the vaso-motor and respiratory centres.

Nothnagel believed that constipation resulted from the drug *stimulating the inhibitory nerves of the intestines* through the splanchnics.

Very large doses injected into the jugular vein of animals purge rapidly by tetanising the intestine. Full doses paralyse the bowel. The stomach excretes the drug from the blood after absorption, and morphine is found in the stomach within a short time after a hypodermic dose—a fact to be remembered in the treatment of opium poisoning.

These hypnotic and anodyne qualities of opium render it

the most important of drugs, and its application in disease is extensive, but only a brief reference to its numerous therapeutic uses can be made.

To produce sleep in all conditions requiring it, and especially when sleeplessness is caused by pain, opium is the most reliable hypnotic known, and it may be used as an hypnotic in the restless *delirium of fevers, acute inflammations, delirium tremens, mania, and melancholia*, contra-indicated when the brain is congested or inflamed, the eyes suffused and pupils small.

As an analgesic or pain reliever, opium or morphine surpasses all others in certainty of action and safety. It relieves the pain of *sciatica, neuralgia, lumbago, gastralgia, and cancer*, and soon removes the agony caused by the passage of *renal or hepatic calculi*. In these cases the hypodermic injection of morphine is by far the best form in which to administer the drug, and it is a mistake to regard its effects as merely palliative, for *sciatica* is sometimes *cured* by a single insertion of the needle, a result which is not met with when morphine is given by the mouth. The physician must guard against the patient getting into the habit of demanding relief too often, as there is great danger of the opium habit becoming established, and under no circumstances should he be permitted to use the syringe himself. Though space prevents any description of the evils arising from opium eating, a word may be said about its treatment. The writer's plan was to stop the administration of the drug completely, and to give large doses of alcohol instead for 2, 3, or 4 days, till the depression and craving are quite blunted, then the alcohol should be gradually withdrawn. In the same way bromides in colossal doses have been employed. Most authorities agree that the *rapid* is preferable to the *gradual* withdrawal of the opium in most cases. When possible the treatment should be only attempted in a properly equipped nursing home.

Cough is relieved by opium, but discrimination should be exercised in the exhibition of the drug for this purpose. In cases of *exhausting bronchitis*, with *profuse expectoration*, where there is only enough cough to empty the tubes, this remedy is a dangerous one; but where a harassing, frequent cough wears down the patient's strength, without much secretion, then opium is a blessing. It acts in these cases by diminishing the excitability of the respiratory centre.

In *acute inflammation* opium gives great relief, and seems in some instances to shorten the attack, and even to save life, but since the introduction of surgical methods of treatment in *acute peritonitis* and grave *abdominal obstructions* this practice has been severely censured as leading to the masking of all the symptoms which should be the guide to the surgeon for operative interference. Nevertheless, it is already evident that the total exclusion of opium in such cases is a cruel mis-

take, and that, given with judgment and discrimination, it is invaluable in many cases of peritoneal inflammation.

The peristaltic action of the bowel is diminished, and thus it is doubly useful in *inflammation* of the *peritoneum* and in *intestinal hæmorrhage*; and from its tranquillising effect upon the circulation it is our sheet anchor in *hæmoptysis* and other *hæmorrhages*.

Small doses ($\frac{1}{10}$ gr. opium) have been found successful in the treatment of *irritative dyspepsia* by Graves; and all *enteric affections*, with excessive secretion, after the irritating cause has been removed by purgatives, are benefited by opium—thus *dysentery*, *enteritis*, *cholera*, etc., are so relieved.

After *abdominal surgical operations*, a morphine suppository is followed by great benefit, and opium has been found useful in averting the rigor liable to follow *urethral irritation*. The presence of severe pain is always an indication for a large dose of this drug; women are more susceptible than men; children bear opium badly, and the physician will be wise who makes the rule, in the first few years of his practice, never to give opium in any form to a child under a year old. Gout and renal disease have been said to be barriers to the use of opium; but experience shows that the hypodermic injection of morphine may be beneficial in *uræmic convulsions*. The administration of opium diminishes greatly the amount of sugar in the urine in *diabetes*.

Idiosyncrasy influences the dose of the drug, some bearing very small doses badly; and the after evil consequences—headache, nausea, intolerable itching, etc.—vary much in different subjects. Those accustomed to its use can take enormous doses of the drug.

The 18 alkaloids found in opium produce different effects when administered separately; thus—

Morphine and Papaverine are hypnotic; while Thebaine is a violent convulsant acting like strychnine; and Codeine in large doses always produces convulsions in animals; but it is generally only with morphine that the physician has to deal. Morphine differs from opium in being (1) less astringent and constipating; (2) less powerful as a diaphoretic; (3) it possesses less power over acute inflammations, especially in the abdomen; (4) it is less likely to cause excitement, headache, and nausea; (5) it is more decidedly hypnotic and anodyne, and more liable to cause itching and retention of urine.

Morphine and atropine are antagonistic to each other, and the dangerous symptoms often following the hypodermic injection of morphine are certainly less likely to occur if $\frac{1}{100}$ gr. of atropine be added to each dose, and the combination is more effective. Not more than $\frac{1}{8}$ to $\frac{1}{4}$ gr. of morphine should be given for the first time by the hypodermic method.

Of the various official preparations, none equal in certainty

and uniformity pills made out of the crude opium (powdered opium is about $\frac{1}{8}$ stronger). They may be given in 1 to 2 gr. doses ; and next to them in constancy comes the tincture, which generally produces sleep in $\frac{1}{2}$ dr. doses. The favourite Dover's powder expends itself chiefly upon the skin, which it stimulates more than a much larger dose of either of its constituents would do if given singly. 1 gr. of morphine is equal in therapeutic power to about 6 grs. opium.

☞ For Poisoning by opium see Poison Index.

The following is a good hypnotic combination :

℞. *Liq. Morph. Hydrochlor.* ʒss.
Aq. Laurocerasi ℥.xv.
Pot. Bromidi gr. xxx.
Aquæ Chlorof. ad ʒi. *Misce.*

Fiat haustus, hora somni sumendus.

Ovi Albumen.—The liquid white of the egg must be regarded as a food. It consists of about 14 parts coagulable albumin, 3 of mucus, and 83 of water, with traces of salts ; it supplies the blood with an element which is found in most tissues. It is introduced as a test for metaphosphoric acid in Acid. Phosph. Conc., and it is used to coat pills and clarify liquids.

It is an antidote in poisoning by salts of mercury and copper, as it forms insoluble compounds with these.

Ovi Vitellus.—Egg-yolk is highly nutritious, consisting of nearly 30 per cent. of oil and crystallisable fat and 18 per cent. of albumin and some phosphorus. It is used in making emulsions, and enters into Mist. Spt. Vini Gallici.

Oxymel and Oxymel Scillæ. (See under Mel and Scilla.)

Pancreatis Liquor.—The pancreas produces at least four ferments, the most important being *Trypsin*, which changes proteids into peptones in an alkaline or neutral medium ; another ferment—*Rennin*—coagulates milk casein, and changes it into peptones ; *Steapsin* emulsifies fats, and *Amylopsin* changes starch into sugar. This liquor contains at least three of these. The use of pancreatic ferments in medicine is chiefly that of predigesting foods before being swallowed. If the liquor be administered it is mostly destroyed by the acid gastric juice, but notwithstanding this, stomach digestion may be assisted by administering the ferments with the food at the beginning of a meal before the gastric secretion has reached its full acid strength ; in this way the ferments will aid the saliva in changing starch, and proteids will be also attacked. There may be some advantage in administering pancreatic extracts with alkalies in cancer of the stomach where hydrochloric acid and pepsin are both absent.

If pepsin be added to liquid foods the products formed as digestion proceeds are unpalatable and nauseating, and the compound cannot be swallowed or retained ; but if pancreatic liquid be employed, and the digestion stopped after about 15 to 20 minutes, an almost tasteless product can be obtained. This is easily accomplished by boiling, as the pancreatic digestives are destroyed by a heat above 140° F. Trypsin, pancreatin, desiccated pancreas, and various dry extracts are now procurable, which can be administered in *dyspepsia* in the pillular form coated with keratin, so as to supplement the natural pancreatic function in the duodenum. They have also been applied with the view of breaking up the false membrane in *diphtheria*, and for stimulating the growth in *ulcers*, etc., or they may be used like the liquor for mixing with nutrient enemata before being injected, or for injecting into the bladder to disintegrate blood clots.

To make peptonised milk, the liquid is diluted with about one-third of its bulk of water, and heated to 120° F., and 2 drs. of the liquor and 30 grs. bicarbonate of soda added, and the mixture allowed to remain for 15 minutes in a warm place. After this it may be swallowed, or if not to be used immediately it should be brought to the boiling point or placed in ice to stop all further fermentation, else it becomes bitter and curdles. Gruel, soups, or other liquid foods can be treated in the same way.

Fairchild's powder contains a dry extract mixed with soda, and it is more convenient than the official liquor.

The liquor has been administered in *diabetes* where the disease has been suspected to be of pancreatic origin, but 5 gr. pills of pancreatin or of trypsin, coated with keratin, are preferable.

Dyspepsia, gastric dilatation, ulcer, cancer, and tubercular peritonitis, and many other conditions are improved by pancreatic feeding, but the best results are seen in the feeding of infants deprived of their natural nourishment. Benger's food consists of wheaten flour partially dextrinised by dry heat and mixed with pancreatic extract ; during the cooking of the powder with diluted cow's milk pancreatic digestion takes place.

Pancreon is the name given to a reddish-grey powder prepared from pancreas, which is not affected by the gastric juice. It is recommended in 8 gr. doses in cachets or tablets in *diabetes*.

Much interest has been aroused by the reports of cases of *inoperable cancer* being cured by injection of trypsin hypodermically in the vicinity of the tumour, with or without internal dosage at the same time ; there is little evidence of any specific action of the pancreatic ferments in this dread disease.

Papaveris Capsulæ have a faint narcotic action like opium, but the drug is now used chiefly externally. A decoction of the capsules has long enjoyed a reputation as an anodyne when applied to various local inflammations ; its good effects are partly owing to the moist heat of the application.

Paraffinum Durum.—Hard paraffin is used to make a firm, bland, and unirritating basis for various ointments. Its high melting point, hardness, and unchangeableness confer special obvious advantages upon ointments containing it.

The drug has been successfully used by hypodermic and sub-mucous injection to remedy certain deformities beyond the surgeon's skill. Thus the bridge of the nose, destroyed by syphilis, has been replaced by the hypodermic injection of sterilised paraffin of a melting point of about 106° F., and it is never absorbed. This melting point is secured by mixing a little soft paraffin with the hard whose melting point is about 130° F. In other conditions, as in filling up the hollows of bony cavities a paraffin, with the melting point at 120° is employed. Incontinence of urine has been remedied when the sphincter vesicæ has been removed, and even the removed testicle has been replaced by a mass of paraffin in order to avoid deformity.

Paraffinum Molle, or Vaseline, is an emollient not affected by the majority of substances, and exhibits little tendency to become rancid. The absence of irritating or changeable constituents in it, and its absolute freedom from smell and grittiness, render it a good basis for ointments.

It is insoluble in water, and mixes with oils in all proportions, and it dissolves most alkaloids. It is, however, not a good basis if we wish to get these substances *absorbed* through the skin.

Its low melting point is a disadvantage, as when applied to the skin it melts and becomes quite liquid, and soaks into the dressings or garments, often leaving the incorporated substance almost dry and in direct contact with the skin ; the addition of hard paraffin obviates this, and a better basis is obtained by a mixture of the two. Lanoline, lard, or any bland animal oil should be used when we wish to secure the absorption of the active ingredient by the skin. Thus ointments of the alkaloids are now made with lard, whilst the antiseptic remedies, as carbolic, boracic, and salicylic acids, eucalyptus, etc., are usually compounded with vaseline.

Alone, it forms an excellent and bland application to *eczema*, *intertrigo*, *burns*, *sores*, and *scalds*.

Paraffinum Liquidum is chiefly used as a solvent for various substances. It has been given internally as a demulcent, or applied as an emollient in various *skin diseases*, and as a basis for several hypodermic injections, and as a solvent for menthol

and thymol in the solutions used in the various sprays or atomisers, and employed in the local treatment of *diseases of the nose, fauces and larynx*. The soft and liquid paraffins have been vaunted as substitutes for cod-liver oil, but they have no nutritive value, being eliminated from the body in an unchanged condition.

Varieties of liquid paraffin are known in commerce as Paroleine, Glymol, Adepsine Oil, Vaseline Oil, Dee Oil, and Chris-maline.

Paraldehydum is an hypnotic, and resembles chloral in its action, only it has no depressing effect upon the heart; it affects the cerebral cells, and, in poisonous doses, the respiratory centre. It acts as a diuretic, increasing the amount of urine, but has no diaphoretic action. It has been given in *mania, melancholia, sleeplessness* from various causes, with success, and does not cause digestive or cerebral disturbances afterwards. Its only drawback is its rather unpleasant, chloroform-like odour, which affects the breath for many hours, and its sharp, disagreeable taste. It may be given in peppermint water and syrup or in almond mixture, or with whisky, and it may also be given by the rectum. The sleep which it produces is calm and refreshing, like natural slumber. It produces no excitement, and is more speedy in its action than chloral. It is especially valuable as a safe hypnotic in the *insomnia of cardiac diseases and mania*, but like the newer hypnotics it has no effect where pain is present. It has been found useful in *epilepsy and asthma*. Cosimo Noto states that if 45 mins. be given one hour before chloroform narcosis anæsthetisation is perfectly free from danger.

R. *Paraldehydi* ʒiss.
Tinct. Aurantii ʒij.
Aquæ Menthæ Pip. ʒiss. *Misce.*

Fiat haustus, hora somni sumendus.

Pareiræ Radix is eliminated by the kidneys, which it stimulates, thus acting as a diuretic; and, as the active principle passes over the mucous membrane of the genito-urinary tract, it exercises a soothing and tonic influence on the bladder; most valuable in *hæmorrhage and cystitis*. In the same way *suppurative kidney affections* are relieved, and sometimes unhealthy conditions of the *urethra*, causing *gleet* and smarting pain after micturition, are relieved by pareira. Its active principle undergoes change in the blood, for when injected for *gonorrhæa and cystitis* it does not appear to have any local beneficial action, though it appears to act like an ordinary tonic when admitted to the stomach.

The liquid extract may be given in ʒii. doses with liquor potassæ and buchu or hyoscyamus.

Pepsin is a proteolytic ferment, possessing the power in presence of warmth, acidity, and moisture of converting proteids into peptones. Pepsin will work this change outside the body, and there can be no doubt that a similar action takes place in the atonic stomach when pepsin is administered. The deficiency of gastric juice is known in many cases of *cancer*, *dilatation*, *gastric insufficiency*, *atonic dyspepsia* and *chronic gastric catarrh* to be the direct cause of the indigestion, and since there is also always a deficiency in these cases of HCl this acid must be prescribed at the same time and along with or soon after meals.

Pepsin is a *ferment*, and large doses are not generally necessary, since its activity depends more upon the *state* of the stomach's contents than upon the *amount* of the ferment administered. It acts as a direct stimulant to the gastric mucous membrane, which it causes to pour out more secretion. It is recommended in the *diarrhœa of children*, depending upon the presence of quantities of partially digested food passing along the intestines. It is useful in some forms of *vomiting* and *nausea*, probably caused by imperfect digestion.

If added to *nutrient enemata* it greatly increases their chances of being absorbed. Pepsin cannot be used to peptonise food intended for swallowing, as the taste of the product is most unpalatable. It was formerly applied to the false membrane in *diphtheria* with the view of causing its digestion. Papain possesses many advantages over pepsin in the treatment of chronic gastric ailments, since it acts in alkaline, neutral, or even acid media.

Phenacetin possesses decided antipyretic and analgesic powers. It reduces fever heat with safety and certainty, in doses of 5 to 10 grs., which may be given every eight hours; but the practice of employing agents of this class in the routine treatment of fever has been proved to be useless, and often harmful. It reduces the temperature by decreasing heat production and increasing heat dissipation. It relieves pain chiefly by its influence over the sensory mechanism of the cord, though its action on the sensory centres in the brain is also unmistakable. It has been used in all the conditions in which antipyrine and antifebrin are indicated. It has been found not to possess toxic properties to any appreciable extent, and it may therefore be regarded as the safest of the new antipyretic remedies. D-Beaumont gave it as an analgesic in daily quantities of from 15 to 30 grs. for months in every variety of pain always with success, and without harm resulting. *Migraine*, *neuralgia*, *acute rheumatism*, and *ataxy* pains all speedily yield to it. Every form of fever and high temperature also are influenced by it. It is best given in the form of cachet or powder, swallowed with water. The fall in the

temperature lasts four or more hours, and there is generally some sweating, but no rash or cyanosis. It is best given in the evening, and 2 to 4 grs. may be given to children. The urine becomes darkened under its use, shows the indophenol reaction, and has the property of reducing copper sulphate.

Phenazonum.—All that has been said of acetanilide upon page 296 applies to the action of antipyrine, save that this latter drug is taken in treble the amount of dose and is safer, and not likely to produce cyanosis, etc. Thus, its chief action is upon the temperature. This is very slight in health, but marked in fever. It may be taken as established that this reduction of temperature is the result of *diminished production* of heat, and this is effected by its action upon the heat centres ; to a slight extent the fall also depends upon heat dissipation. Metabolism is checked and the urea diminished. Sweating occurs, but it in no way explains the fall in the temperature. The reflex excitability of the cord is much depressed, and, ultimately, anæsthesia results ; the drug acts upon the central sensory as well as on the spinal sensory apparatus. Poisonous doses paralyse the frog's heart, the colour of the blood is altered, and the pressure falls. The drug is eliminated in the urine. Antipyrine has been given in nearly every disease with high temperature and in almost every conceivable feverish condition—*typhus*, *typhoid*, *scarlatina*, *rheumatism*, *erysipelas*, and *pneumonia*. But the routine treatment of these diseases by this agent has certainly fallen into disfavour, as no appreciable gain results in the long run, and the drug is not to be relied upon in *hyperpyrexia*, where the cold pack or bath is often the sole means of saving life. In *phthisis* with high temperature 10 grs. at first, and 5 grs. in one hour, and 5 grs. in one hour again, may cause the temperature to drop as many as 10° F., with relief of all the symptoms and distress for the time. Formerly these doses were doubled, and the drop often lasted 20 hours. Small and frequently repeated doses, though safer, are not satisfactory. It may be given hypodermically or by rectum. Often the temperature falls without sweating ; there is sometimes cyanosis and even collapse, followed by the appearance of a rash. It is calculated that ten times the above dose would be required to make a decided impression on the body heat in health. In the febrile diseases of childhood (1 gr. per year) it may be given hourly for 3 doses, and it has marked power in reducing the frequency of the paroxysms in *pertussis*.

In addition to its antipyretic action it is a powerful hæmodynamic when administered internally or applied locally ; it controls *epistaxis*, and its action is intensified if tannin be added to the 5 per cent. solution. Antipyrine is one of the most certain of analgesics, and there is hardly any pain which

is not relieved by it. Its effect in *migraine* is most satisfactory. In nearly every form of headache and neuralgia, swallowed in doses of 10 to 15 grs. and repeated often, it generally gives speedy relief. The lightning pains of *ataxy* and the *gastric crises* are cut short by it. Aneurysmal and anginal agony also yield to it. After the relief of pain sleep often follows. The pains of labour are rendered bearable, and if ergot be administered it is said almost painless labour may result; *dysmenorrhœa* may be relieved. The drug has also been given with success in *diabetes*, *sea-sickness*, *epilepsy*, *nocturnal emissions*, *asthma*, *hæmoptysis*, and *laryngismus*. Hypodermically 5 to 15 grs. in water will relieve local pain and neuralgia, like morphia, but it causes smarting and local sores.

The writer now generally gives the drug in combination with caffeine as in the recipe appearing upon page 342.

In *pleuritis* it is claimed that small doses cut short the attack, and have a surprising effect upon the absorption of the effused fluid. The writer is satisfied that 3 to 5 grs. every three hours give the most satisfactory results in *influenza* and in *inflamed sore throat*, and if the drug be given early in the first-named disease the attack is modified, complications are less likely to occur, and the gravity of the attack is lessened.

Phosphorus is a true restorative or hæmatinic, supplying a normal constituent to the blood, nerve tissue, and bones, when from any cause the body is deficient in its due proportion of the element. After a course of small doses the mental faculties seem more active, the circulation is quickened, and the pulse rises; the temperature is said to rise also; the products of waste are increased in the urine; and the appetite increases, whilst the nutrition of the body also is improved. After a considerable time the bones are affected, osseous deposit filling up the medullary canal, and it has been proved by Wegner that the cancellated tissue becomes compact bone.

Large doses cause vomiting, purging, albuminuria, and the ordinary signs of irritant poisoning, only the symptoms may first show themselves *many hours after the dose has been taken*. These symptoms may subside, a lull or apparent recovery supervening when they return with cardiac weakness, reduction of temperature, jaundice, hæmorrhages, convulsions, and death, after which are found fatty degeneration of the liver, bloodvessels, and muscular tissue generally. These symptoms are not unlike those observed in *acute yellow atrophy of the liver*. Oliver states that the average duration of the attack from the swallowing of the poison till death is in the adult seven and a half days, children sometimes dying in a few hours.

In phosphorus poisoning, should the patient survive long enough, the hepatic connective tissue is increased and cirrhosis results, with marked fatty degeneration. This latter change

is produced by the *increased metabolism* and *diminished oxidation* which characterise the action of the drug, the fat being derived from the rapid splitting up of the protoplasm of the cells, though the most recent observers maintain that the fat in the cells of the liver and other organs is simply deposited in them after being carried from other tissues.

From its restorative effect upon the nervous system, phosphorus has been extensively tried in *neuralgia*, on the ground of this affection being always associated with a more or less impoverished condition of the diseased nerve. Sometimes benefit follows its administration, but more frequently it fails utterly. It is sometimes valuable in cases of *simple brain exhaustion* from prolonged mental strain. It acts upon the centres which preside over the *reproductive act*, and is an aphrodisiac in cases of functional loss of power.

In affections depending upon mal-nutrition, *pernicious anæmia*, and *leucocythæmia*, phosphorus has been occasionally found useful. Kassowitz has demonstrated its value in *rickets*, and states that cranio-tabes of a most marked character, involving both the occipital and parietal bones, disappeared completely in from four to six weeks, and children who had never been able to stand or sit upright were found running about after taking phosphorus for one or two months. The dose for a child 12 lbs. weight was from $\frac{1}{120}$ to $\frac{1}{60}$ gr. in the day. The writer has ventured to point out a possible danger in giving this drug in some cases of rickets, as it may cause the bones to harden in their bent condition. Phosphorus has been used in *tubercular meningitis* and *diabetes*, but with very doubtful benefit. Its stimulating action upon the skin has led to its questionable employment in developing the suppressed rashes of the eruptive fevers, and as a substitute for arsenic in *chronic scaly skin diseases*. From its influence over the growth of bone, it is used as a constitutional treatment for *ununited fractures*, especially during pregnancy, and for *osteomalacia*.

The *fumes* of phosphorus cause disease of the jaws, leading to exfoliation of the bone; this action is a local one, caused by the vapour reaching the alveolus through a decayed tooth. It does not follow the internal administration of the drug, even in poisonous doses, and only affects those exposed in the manufacture of lucifer matches who have caries of the teeth. Many authorities believe that in the so-called "Phossy Jaw" there is some other factor in addition to the phosphorus fumes, as all recent experiments have failed to produce necrosis in the jaws of animals exposed to the fumes, even when the teeth have been extracted and a portion of the bone exposed. The operatives in match factories often suffer from a peculiar cachexia like that seen in phthisis, and considerable numbers of them suffer from spontaneous fractures of the long bones.

Not more than $\frac{1}{80}$ gr. should be given at first, and its effects should be carefully watched. The phosphorated oil may be given in gelatin capsules, each containing 2 mins., or 1 to 2 grs. of the recently prepared official pill may be prescribed. The writer prefers to give it in rickets in combination with cod-liver oil—20 to 30 mins. of B.P. phosphorated oil mixed with 6 ozs. cod-liver oil—the dose of the mixture being 1 dr.

For *Phosphate* and *Hypophosphite of Calcium* and *Phosphoric Acid*, see under Calcium and Acid. Phosphoricum. None of these substances possess the therapeutical virtues of free phosphorus, which enters the system and remains in the blood as the element—phosphorus—and not, as has been supposed, after its conversion into phosphoric acid or a salt. Compounds in which the affinities of phosphorus are not completely saturated produce poisonous results not unlike phosphorus. They are not, however, used medicinally. Dr. R. Maguire has recently demonstrated that oxalate of lime calculi in the kidney or bladder may be dissolved by large and continuous doses of the acid phosphate of sodium.

Physostigma and Eserine.—Calabar bean is a deadly paralysing agent, long used by the West Africans as an ordeal for determining the guilt or innocence of suspected witches.

The drug causes vomiting, colic, and diarrhoea, with increase of blood pressure and salivation, and general muscular weakness and giddiness. If the dose be continued, *profound depression of the cerebral and spinal motor centres* follows, with loss of reflex action and death from paralysis of the respiratory centre. The pupil is nearly always contracted, and there are marked muscular twitchings all over the body, which may simulate convulsions; these are caused by the action of the drug upon the peripheries of the nerves in the muscle or upon the muscular fibre itself. The cerebrum is unaffected, the mind remaining clear till death. The drug resembles pilocarpine in most respects, thus it increases the secretions, viz., sweat, saliva, tears, gastric juice, pancreatic fluid, etc., by stimulating the ends of the nerves in the gland cells. Peristalsis is greatly increased, and Cushny thinks that the unstriated muscle in the bowel and stomach being powerfully stimulated, a large quantity of blood is driven from the splanchnic area, and goes to increase the general blood pressure, which is always augmented. This latter result is no doubt also due to the stimulation of the vaso-motor centre, though the action of the drug upon the heart itself has not been clearly demonstrated.

The local action of the drug always causes marked contraction of the pupil by stimulating the peripheries of the motor nerve in the sphincter of the iris, whilst at the same time the

nerve peripheries in the ciliary muscle being affected, there is spasm of accommodation.

† Physostigma contains Eserine or Physostigmine and Calabarine; the former produces effects resembling those produced by the bean itself, whilst the latter causes tetanic convulsions like strychnine. A third alkaloid—Eseridine—resembles the action of the first. They appear in the urine soon after administration.

Physostigmine is antagonistic to atropine, and may be tried in cases of poisoning by this drug, but it is a noteworthy fact that, whilst a small dose of atropine will antagonise a very large dose of eserine, it requires a colossal dose of the latter to antagonise a full dose of atropine. It has been used in *tetanus*, and in various convulsive diseases, in *chorea*, *epilepsy*, *paralysis agitans*, *acute mania* and *general paralysis of the insane*, and in minute doses for *chronic constipation* and *bronchitis*, with the view of stimulating the involuntary muscular fibre ($\frac{1}{8}$ gr. of the extract). It should be given hypodermically, but the drug is very seldom employed internally. It is for its local action that Calabar bean is so valuable in ophthalmic practice; the alkaloid—Eserine—applied to the conjunctiva produces contraction of the pupil, diminishes intra-ocular tension, and causes spasm of accommodation. The official discs or a few drops of a solution of the sulphate (1 gr. to 1 oz.) are used for this purpose—(1) to counteract the effects of atropine; (2) to prevent prolapse of the iris after *wounds of the cornea*; (3) to diminish the amount of light falling upon the retina in hypersensitive states or inflammations of the eye, as in *strumous ophthalmia*, *ulcers*, etc.; (4) to diminish intra-ocular pressure in *glaucoma* and *perforating keratitis*; (5) used after atropine to break down the adhesions resulting from *iritis*. It has occasionally proved beneficial in *detachment of the retina*.

Picrotoxin, in doses of a few grains, is a powerful poison, irritating the respiratory and vaso-motor centres, and producing violent *clonic* muscular contractions from its stimulating action upon the medulla, whilst the spinal centres are scarcely, if at all, affected—the opposite condition of affairs which occurs in strychnine poisoning. Though some authorities still regard the convulsions as of spinal origin, the fact that they are entirely prevented by the destruction of the medulla must be accepted as conclusive. It has been used in *epilepsy*, especially in the nocturnal variety, in *paralysis* affecting the muscles of the pharynx, and in *sick headache*. It is, however, to check the *night-sweating of phthisis* that this drug has been much used, and good results have been obtained by Murrell, who first introduced it, in doses of $\frac{1}{200}$ to $\frac{1}{100}$ gr., three times a day. It probably acts in this condition by stimulating the respiratory centre.

It may be given in pills, and the dose increased to $\frac{1}{25}$ gr., or in solution with a little acetic acid ; or hypodermically, $\frac{1}{50}$ gr. It is antagonistic to the action of chloral hydrate, and slightly also to that of morphine, eserine, and aconite.

Externally, an ointment (1 gr. to 1 dr.) kills *pediculi*, but it must be used with caution.

Pilocarpine. (See Jaborandi, page 408.)

Pimento is a stomachic, like cloves, and though in large doses it acts as a stimulant of some power, still it is seldom employed in medicine, except as a flavouring ingredient or adjuvant to purgatives. Like pepper, it improves digestion and increases the vascularity of the mucous membrane, when mixed with food. Hence it may be taken as the type of a condiment.

Pinus Pumilio Oil acts like turpentine, and has been used as an inhalation in pulmonary complaints, and is the basis of the "pine cure" practised at various health resorts. Inferior terebinthinate products from the same pine are used in baths for *rheumatism*, *sciatica*, and *gout*.

The oleum pini may be taken internally (5 mins.) in *bronchitis* and all wasting lung diseases ; it is excreted by the bronchial surface and acts as an astringent and expectorant resembling turpentine oil. It may be used as a spray, or inhalation, or the vapour may be inhaled from the handkerchief, or it may be put into any of the various respirators or inhalers, thus the phthisical patient may be enabled to live in an atmosphere saturated with the oil, as it possesses only very slight irritating qualities. In this way at home the benefits of a stay at Arcachon may be to some extent enjoyed. Dr. Davidson has obtained excellent results from this treatment at Bournemouth.

Piper Nigrum is a carminative resembling pimento in its stomachic qualities. It has been supposed, on insufficient evidence, to possess febrifuge properties. It is eliminated by the kidneys, which it stimulates, and it increases the amount of their secretion, but its diuretic action is uncertain ; it imparts to the urine a characteristic odour. In passing over the genito-urinary tract it exercises a beneficial influence upon the bladder and urethra, and has the power of bracing up the relaxed and chronically inflamed mucous membrane of these parts in *gonorrhœa* and *gleet*. In this respect its action resembles that of cubeb ; it may stimulate, by reflex action, the genital organs, and possibly aggravate matters in the acute early stages of the disease. The *excess* of the remedy which passes through the intestines unabsorbed is decidedly beneficial in inflamed and relaxed conditions of the mucous membrane in the neighbourhood of the anus. In *hæmorrhoids*

its good effects will be found by giving the official confection in teaspoonful doses three times a day. If cubebs be added, and copaiba balsam substituted for the honey, a preparation results which will seldom fail to arouse a healthy action in relaxed and painful affections about the anus ; or the following may be used with or without the cubebs :—

R. *Pulv. Piperis Nig.*
Pulv. Carui Fructus
Pulv. Cubebæ ana ℥ss.
Glycerini q.s. Misce.

Fiat electuarium, capiat coch. parv. ter in die.

Pix Burgundica is a mild rubefacient, and its physical qualities render it suitable as a basis for plasters, which are used in *lumbago*, *rheumatism*, and various painful *joint* troubles, where they act by stimulating the lymphatics and protecting the parts from variations of temperature.

Burgundy pitch has been supposed to exert some special action upon the rectum, and has been employed for *hæmorrhoids*, made into pills with the following liquid.

Pix Liquida.—Wood tar contains amongst its complex constituents some creosote, turpentine, and phenols, upon which many of its properties depend. It is thus antiseptic and stimulating, and possesses considerable power in checking profuse bronchial secretion ; and as an expectorant is decidedly superior to any compound which can be distilled from it. It probably exerts its beneficial tonic effects upon the bronchial mucous membrane in the act of its elimination. Yeo finds that tar exhibits its expectorant qualities either when swallowed, inhaled as spray, or used as a fumigation ; and Ringer advocates its administration in *winter-cough*.

Tar possesses decided advantages over creosote and carbolic acid in the treatment of *chronic scaly skin affections*. It is a powerful stimulant when applied to a healthy sensitive skin, and often causes considerable inflammation and pain, especially in regions where there is much hair. In *psoriasis* the ointment of tar sometimes cures ; and in *chronic eczema*, with painful itching, it will be found to relieve the itching, and, at the same time, to remove the disease which causes it.

The internal administration of tar in 5 or 8 min. doses, gradually increased to 15 mins., in pills or capsules, is often employed in *chronic eczema*.

Tar water is made by adding 1 part of tar to 4 to 10 parts of water, and, after agitation and subsequent rest, on being poured off it makes a good stimulating lotion for *wounds* and *sluggish ulcers*. As a means of administering the remedy, it may be taken in 5 oz. doses ; 3 grs. of tar may be made into a pill with 1½ grs. lycopodium.

Pix Carbonis Præparata.—Coal tar has the same action as wood tar.

Chaplin advocates his "creosote chamber," which is a small room where the fumes of tar over a spirit lamp are inhaled for about one hour in cases of *fetid expectoration*, *bronchitis*, etc.

The Liquor Picis Carb. is now the representative of the old Liq. Carb. Detergens, which is one of the best remedies for *chronic eczema*.

Hutchinson recommends a lotion of 1 oz. Liq. Plumbi Subacet. and 7 ozs. Liq. Carb. Deterg. A teaspoonful mixed with 10 ozs. water, as a lotion, to be applied on lint to the parts at night, and covered with oiled silk, and an ointment consisting of Liquor Carbonis, to be applied in the day-time. It markedly relieves the burning itch of *lichen planus*, *eczema*, and *pruritus senilis*, and is highly beneficial in *psoriasis*, but must be used with great caution in all acute inflammations of the skin. The following formula will be found the best routine treatment of *chronic eczema*, seldom failing to cure this obstinate disorder:—

R. *Liquor. Carbon. Deterg.* ʒj.
Liquor. Plumbi Fort. ʒss.
Hydrarg. Ammon. Chlor. ʒj.
Vaselin et Lanolin. āā. ʒss. *Misce.*

The liquor may be painted over diseased patches of *psoriasis* or *inveterate eczema* and permitted to dry. The liquor upon being added to water makes an emulsion, which is a powerful antiseptic, and can be used for *foul wounds*, *putrid sore throat*, or taken internally in *bronchial affections*, *winter-cough*, *hæmorrhoids*, etc.

Plumbum.—The soluble and insoluble salts of lead are all more or less poisonous (the acetate is the only one used internally), and when administered for a time they give rise to grave and varied symptoms of chronic poisoning, known as Plumbism. There is loss of appetite, wasting, anæmia, and constipation, followed by slowing of the pulse and heart's action, with violent colic, cramps in the flexor muscles, arthralgia, and paralysis of the extensors of the forearm, causing drop-wrist; occasionally blindness, deafness, headache, stupor, and convulsions are observed.

Lead becomes fixed in all the tissues, chiefly in the central nervous system, and in the affected muscles. These at first present no sign of change on the application of electricity; but as the paralysis lasts the reaction of degeneration is elicited, the current seems to have less and less effect, till finally it does not cause any contraction, and the muscular fibres become the seat of fatty degeneration, and ultimately

lose all traces of striation. The drop-wrist and drop-foot are usually bilateral; wasting follows, but does not precede the paralysis of the extensors, and in the forearm the supinator longus and in the leg the tibialis anticus escape. The change probably is of spinal origin, since it generally occurs in groups of muscles which act together, as in the forearm and hand; but other groups of muscles may be affected, as those of the larynx, eye, and leg. Many authorities maintain that the affection is of the nature of a true peripheral neuritis, the changes found in the cells of the anterior cornua of the cord being secondary to this.

The joints get stiff and very painful, probably owing to gouty changes, for lead prevents the excretion of urates by hindering the decomposition of uric acid. The structure of the liver and kidneys becomes affected, causing slight jaundice and albuminuria; and gout may supervene. The urine, at first scanty, becomes abundant and clear. It has been shown that the red blood discs are destroyed. *A blue line appears along the gums*, near to the teeth; this is known as Burton's line; it is caused by the metal deposited in the tissue of the gums being converted into a sulphide by the action of sulphuretted hydrogen generated by bacteria. It is best marked over the region of the incisors, and is absent or indistinct where the teeth are away.

The walls of the arteries contract, the blood pressure rises, the pulse slows, and becomes tense and full, the vascular condition being almost identical with that found in cases of contracted kidney.

The central and peripheral nervous system is seriously affected by lead, the changes in the sensory nerves giving rise to various neuralgic symptoms throughout the body; thus, arthralgia, gastralgia and sciatica may give trouble, sensibility to touch becomes diminished, and especially about the upper part of the body. The optic nerve occasionally suffers, producing amaurosis, and the condition known as "Lead Encephalopathy," in which epileptic convulsions are followed by coma, occasionally is observed, and this may terminate in insanity, chronic delirium, hemiplegia, or a general paralytic condition.

Abortion often results from lead poisoning, either on account of the toxic power of the drug on the foetus or from its influence over the muscular tissue of the uterus, and diachylon (lead plaster) is often administered criminally to induce abortion in the Midland Counties of England.

Lead is eliminated by the urine, bile, intestines, and saliva, but chiefly by the intestines.

The symptoms of acute lead poisoning generally noticed after a large dose of the acetate are a sweet taste in the mouth, soon followed by nausea, thirst, vomiting, intense abdominal

pain, and sometimes diarrhœa, great reduction in the pulse-rate, collapse with livid lips and pallid face and convulsions or coma—symptoms which depend mainly upon the local irritant action of the salt.

As the different salts of lead have slightly different actions they may be referred to under their different names.

Metallic Lead is inert in the system till converted into a soluble salt by acids, as those of the stomach, where it is converted into the chloride and finally absorbed as albuminate.

Acetate of Lead is a valuable astringent. It combines directly with albumin, forming albuminate of lead, and when a strong solution is applied to a fresh wound or sore, a film of this substance imperfectly glazes it over. It causes contraction of the vessels when applied in weaker solution; thus, it directly diminishes the blood supply, acts as a local sedative, and checks excessive secretion in *ulcers, wounds*, and most *local cutaneous inflammations*. *Itching* is often relieved in this way, and a weak solution (5 grs. to 1 oz.) makes a good injection in *gonorrhœa* and *gleet*. In the painful, red, and inflamed stage of *eczema*, characterised by much serous discharge or weeping, lotions of lead give relief by constricting the small vessels, diminishing pain, itching, and discharge. The danger of absorption of the drug through the skin when used externally for long periods must not be overlooked.

Lead Collyria should not be used in ulceration of the cornea on account of the danger of their forming opaque deposits in the tissue, interfering with sight.

Internally, the acetate finds its way into the blood, probably as an albuminate, and by its astringent effect upon the smaller vessels it diminishes the secretion of the bronchial tubes, and was formerly believed to stop *hæmorrhages*, as in *hæmoptysis*. 2 to 5 grs. may be given every two or three hours, and there is little danger of lead poisoning except in very susceptible subjects. Though it is very doubtful that lead has any remote astringent action as in *hæmoptysis*, it undoubtedly checks *diarrhœa*, and tends to prevent *gastric* and *intestinal hæmorrhages*. The following may be tried:—

R. *Plumbi Acetatis* gr. xxxij.
Liq. Morphineæ Acet. ʒiss.
Acidi Acetici Diluti ʒj.
Aq. Destillatam ad ʒviij. *Misce.*

Fiat mist. sumat cochlearia ii. ampl. secundis horis.

The *Subacetate Solutions of Lead* act like the acetate, and are generally confined to external application, where their unirritating astringent action renders them invaluable in *local cutaneous* or *superficial inflammations*, and *erysipelas*.

A valuable astringent application to *sprains*, etc., may be

made by mixing Liq. Plumbi Subacet. ʒss. ; Acid. Acetic. Dil. ʒij. ; Spirit. Vini Rectif. ʒiss. ; Aquæ Rosæ ad ʒxij.

Carbonate of Lead is only used externally as a sedative and astringent application to excoriated or inflamed surfaces, either in the form of ointment or in fine powder dusted over the affected spots; white paint relieves the pain of *burns*.

The *Oxide* possesses similar desiccant properties, but is seldom used.

Iodide of Lead combines the alterative qualities of iodine with the astringent properties of lead. It is supposed to have a beneficial action in *scrofula*, but is not given internally. Externally, it is used in the form of a plaster or ointment.

The various plasters containing lead most probably act entirely independent of their metallic constituent, which is not absorbed in this form into the system. They act mechanically, as before explained, by causing such pressure when properly applied as will alter the circulation, and, acting as a stimulus to the lymphatics, will assist the removal of effused products or *indolent enlargements*. By covering up the affected or diseased parts, they protect them from all sources of external irritation, especially from changes of temperature, and promote a more rapid interchange between the blood and the tissues, hastening repair, and at the same time, in the case of *diseased joints*, securing some degree of rest. The superficial spot so treated is placed upon the same favourable conditions as a deeper part.

In chronic lead poisoning, iodide of potassium is used to dissolve out the insoluble metallic compounds lodged in the nerves, viscera, muscles, and brain, but its administration must be backed up with purgatives, especially saline sulphates, which will cause removal of the soluble salts of lead eliminated by the intestines. Sulphur baths may be employed, and the tone of the affected muscles must be kept up by friction and the free use of the constant or slowly-interrupted current. Alum has also been used with success, and belladonna is very useful in lead colic and paralysis.

As a prophylactic treatment to those much exposed to the fumes or dust of the lead compounds, lemonade made with sulphuric acid, instead of citric or tartaric, has proved beneficial; and a diet largely composed of milk and white of eggs has the power of preventing the poison affecting the system. Scrupulous personal cleanliness is a very important point.

Podophyllum is a cholagogue cathartic. The resin is the form in which the substance is generally administered. It is an irritant when applied to the surface of the body; and the dust produced by powdering it, coming in contact with the skin, causes sores and eye irritation.

It produces free purgation, with watery stools, by irritating

the mucous membrane and acting as a powerful stimulant to the intestinal glands, whose secretion it greatly increases. The most of its force is spent upon the duodenum, whose contents it sweeps rapidly down the tube, resembling in this respect calomel; and hence the name frequently given to it of "vegetable calomel." The resemblance ends here, for podophyllin does not possess any of the *alterative* properties of calomel. Podophyllin will purge when injected into the veins, cellular tissue, or serous cavities, or if applied to an ulcerated surface.

In its action podophyllin closely resembles jalap, only ordinary purgative doses ($\frac{1}{8}$ to $\frac{1}{2}$ gr.) are more tardy in producing their effects, and are much more variable in their results upon different individuals. Sometimes $\frac{1}{4}$ gr. of the resin purges in a few hours, while $\frac{1}{2}$ gr. in another individual will not operate for 10 or 14 hours, and in a third may produce no purgation at all. Florid individuals, or those with much red pigment in their hair, may be often noticed to be very susceptible to the action of the drug. Often great pain results from the administration of podophyllin, especially from impure samples of the resin; common salt increases the cathartic properties.

Rutherford found that it produced decided stimulation of the liver, and marked increase in the amount of bile secreted. The bile is its proper solvent, but if a large dose of the drug be given the hepatic secretion in which it is dissolved is not absorbed, but is swept along the intestines, and the liver is less stimulated than if only moderate quantities had been administered. In doses sufficient to cause severe purgation the biliary secretion is decidedly diminished.

These effects upon the liver and intestines render podophyllin a popular drug in various diseases of the *liver* and *bowel*; thus for passive congestion, or *hepatic torpidity*, or *obstinate constipation*, $\frac{1}{2}$ gr. of the resin will be found a valuable remedy, relieving the portal circulation speedily. The danger of griping will be removed by the addition of extract of belladonna or hyoscyamus; and if combined with some good cathartic pill, as aloes or colocynth, its action is much more certain and uniform, though Wood believes that owing to the tardiness of its operation it should not be combined with speedy cathartics. He advises its combination with calomel, which takes about the same time to act. This must be also advantageous from another point of view, because calomel and podophyllin act upon the same portion of the small intestine, and must consequently intensify each other's effects.

By such a combination of purgatives as colocynth, podophyllin, jalap, and aloes, we get a more valuable intestinal stimulant than if any one be ordered singly in a large dose. By this means we also ensure an action possessed by no solitary

drug, since the entire intestinal tract from the stomach to the anus is equally stimulated.

R. *Resinæ Podophylli* gr. $\frac{1}{4}$.
Extracti Colocy. Co. gr. ii.
Hydrarg. Subchlor. gr. iiss.
Extract. Hyoscyami gr. iss. *Misce.*

Fiat pil. mitte tales xii., st. i. pro re nata, hora somni.

Potassium.—In *very large* or *colossal* doses all the salts of potassium act as powerful poisons independent of the acid with which they may be chemically combined. The respiration, cord, and nerve centres are weakened, the heart is depressed, and its movements rendered slow and irregular; and there is a fall of temperature and blood pressure.

One large dose of any potassium salt injected into the veins of an animal causes sudden arrest of the heart's action and death. Ringer believes that the potassium salts act as pure protoplasmic poisons, destroying all nitrogenous tissues, the more highly organised nerve centres suffering first.

The blood becomes thin and poor when the administration is protracted, and there is loss of weight from absorption of the fat deposited throughout the body, the digestive organs are interfered with, and large doses cause paralysis of the muscular coat of the stomach and intestines. In small doses these salts are restorative, supplying the place of those used up in the blood corpuscles and in muscle. Potassium salts exist normally in the *solid* tissues, whilst sodium salts abound in the fluids of the body. Most of them are diuretic and slightly purgative. The salts of potassium possess higher diffusive power, and more readily enter the blood than the sodium salts. They increase the formation of *bile*. The soda salts should always be selected in preference to the potash salts, where prolonged administration is necessary, owing to the depressant effects on the heart and brain being less. There are, in many points, close resemblances between the potassium and sodium salts, and they may be taken as the representatives of a very important chemical class of therapeutic agents—the alkalies.

The alkalies when admitted to the stomach act as direct stimulants, and may increase the quantity of gastric juice when given before food; and thus their occasional utility in *atonic dyspepsia*. Ringer's law in reference to acids holds true conversely when applied to alkalies—*i.e.*, that alkalies check all alkaline secretions, while they stimulate all secretions of an acid reaction.

In *irritative dyspepsia* the alkalies give great relief after meals by neutralising large amounts of irritating lactic, butyric, and in some cases hydrochloric acids. As will be

mentioned further on, they diminish or prevent acidity of the urine, and they act as expectorants.

Potassa Caustica.—From its affinity for water, and its power of dissolving albumin, this substance, when applied to the tissues, causes their rapid destruction, producing an extensive eschar. Its destructive action being both deep and wide, its use must be restricted to such parts where no vital organs or structures are within reach. Its deliquescent properties cause it to run over the skin if allowed to remain in contact with it long; hence it is desirable to circumscribe its action with a ring of adhesive plaster, or with some adhesive cerate of firm consistence.

When the solid stick is applied to the skin for the destruction of any very superficial part, a contact of short duration will suffice, and blotting paper should be applied to absorb the moisture, else the eschar will be much deeper than is intended. *Cancers of epithelial* origin may be often satisfactorily treated in this way. It was used for making issues, and is still occasionally employed in opening *abscesses* or *cysts* in the interior of the abdomen, or in the substance of the liver. A series of mild applications of the caustic excites such inflammation that the abscess or cyst wall becomes glued to the abdominal parietes, when it may be opened with the knife or with further applications of the caustic without any danger of the contents escaping into the peritoneal cavity. *Unhealthy, foul ulcers*, showing a tendency to spread by sloughing, may be destroyed with caustic potash, and its efficacy in various chronic indurated conditions of the *os uteri* is highly spoken of. In these cases the good effects are not so much owing to the destruction of diseased tissue as to the alteration in the diseased action which always follows the free use of the caustic. The caustic, apparently, acts as a powerful stimulant to the healthy tissues, hastening repair and growth, and substituting a healthy inflammation for some abnormal tissue change.

The deliquescent properties and severity of action are corrected by mixing it with rather more than its own weight of lime, and making it into a paste as required, with alcohol; this is known as Vienna paste—a safer, milder, and more manageable remedy than the pure caustic potash. Internally, it is never given in the solid state, since small quantities would act like the powerful corrosive poisons, and cause death by destroying the mucous membrane of the stomach and gullet.

Potassæ Liquor is the form in which caustic potash is administered internally, though, if given in its undiluted strength, it is a powerful corrosive poison. Applied to the cuticle, it dissolves it, and is used for *in-growing toe nail*, with a view of softening the nail and facilitating its removal. As a lotion in very dilute solution it is likewise useful in *skin*

affections, where it may be employed either to partially dissolve or hasten the removal of scales, as in *psoriasis*, or to allay the itching of *eczema*, *urticaria*, etc.

When *Liquor Potassæ* or any solution of the hydrate (largely diluted) is swallowed it readily finds its entrance into the blood on account of its easy diffusibility, but it first neutralises any free acid with which it comes in contact in the stomach ; it acts thus as an antacid, either locally or after its admission into the blood.

Hence it has been used to check excessive acidity anywhere, as in *irritative dyspepsia*, or acid conditions of the urine, leading to uric acid deposits ; but if given in doses sufficient to produce this remote antacid effect it will be often found to irritate the stomach, and, consequently, the less irritating bicarbonate or citrate is always preferred. It increases and liquefies the secretion in *bronchitis*, and has been given in the various forms of *rheumatism* and *gout*. It is diuretic to some extent, as it passes out by the kidneys, but it possesses less power (in safe doses) over the state of the urine than the citrate and carbonates. It does, however, cause an increase in the nitrogenous elements of the urine, possibly by encouraging the various tissue changes or destructive metamorphoses throughout the body, and not by any mere diuretic action of the drug. It has been used in *obesity*.

It appears to possess special sedative influence over the *bladder* and *urethra*, and its use in various irritable conditions of these parts, caused by unhealthy urine passing over them, is more liable to be followed by good results than if any of the salts had been given, the bicarbonate or citrate excepted.

Small doses, given with a vegetable tonic before meals, increase the flow of the gastric juice by acting as a direct stimulant to the mucous membrane, in the same way that acids given before meals correct or prevent the excessive secretion of acid juice.

Potassa Sulphurata possesses the properties of the sulphur compounds in a more marked degree than those of the potassium salts, and will be referred to under Sulphur.

Potassii Acetas, Citras, and Tartras.—These salts, in moderate doses (about 30 grs.) enter the blood speedily. They circulate along with it, acting as restoratives to the corpuscular elements and muscles and the various tissues containing potassium salts ; reaching the kidneys the excess is excreted in the urine. Before passing out of the body the salts of potassium, with vegetable acids, are converted into carbonates or bicarbonates, increasing the alkalinity of the blood and rendering alkaline the acid urine. The alkalinity of the urine results even if the salts contain an excess of acid, and may occur, though slightly, after the use of the acid tartrate ; and

since they possess no local corrosive action, but may be taken in doses ten to twenty times larger than is necessary to produce their diuretic effect, they may be administered freely.

In this way the urine may be kept alkaline for many weeks, and during that time small uric acid stones in the kidney may be dissolved or so reduced in size that they may pass down the ureter and be expelled through the urethra. In health these salts often fail to increase the amount of urine.

In large doses, the tartrate, citrate, and acetate of potassium act as purgatives, from $\frac{1}{4}$ to $\frac{1}{2}$ oz. in solution being generally enough to cause mild catharsis. They are diaphoretic and febrifuge, opening up the cutaneous circulation by causing dilatation of the superficial capillaries, and the resulting perspiration affords one way for the extraction of heat from the body. It is, however, probable that at the same time they cause such alterations, either in the density or composition of the blood, as prevent or retard the changes taking place in that fluid upon which the increased temperature of the body may depend.

In *acute rheumatism* these salts are often found beneficial; by increasing the alkalinity of the blood they probably counteract the effects of the rheumatic poison, and thus reduce the body heat and assist in the cure of the disease. Their antacid properties do not, however, account for all the good they do in acute rheumatism, for they probably exercise a *sedative* influence over the nervous system, though it is by no means clear that they materially shorten the length of the attack. (See Potassii Bicarbonas.)

The *acetate* of potassium is the most certain diaphoretic of the vegetable potassium salts; the *citrate* is the most reliable diuretic; whilst the *acid tartrate* possesses the most pronounced cathartic properties. The citrate is more commonly ordered than any other potassium compound, since it is this salt which is formed when the carbonate or bicarbonate is administered in effervescence with lemon juice. In this form the citrate is an elegant gastric sedative, and it is beneficial in irritable conditions of this organ; with the addition of a little morphia no combination gives such relief in *phthisis* when the skin is hot and dry, the cough harassing, and the tongue furred. The good effect in such cases is to some extent owing to the carbonic acid gas coming in contact with the peripheral nerves of the irritated mucous membrane. These salts (especially the citrate) were formerly used in *scurvy*, on the theory that the disease was caused by a deficiency of potassium in the system.

It is the *citrate* which should always be selected when we wish to act upon the urine and keep it alkaline for any considerable length of time, because this salt has the slightest destructive action upon the blood, and is the least likely to

derange the digestion by its prolonged administration. (See recipe on page 305.)

R. *Potassii Acetatis* ʒss.
Liq. Ammon. Acet. ʒij.
Syrupi Aurantii ʒss.
Aq. Camphoræ ad ʒviij. *Misce.*

Fiat mistura, cujus capiat ʒj. quartis horis.

The *acid tartrate* may be given with sliced lemon in hot water, sweetened with a little sugar. Its purgative power is increased if it be administered in less water than will dissolve it; and there are few more agreeable laxatives than a paste made of cream of tartar and orange marmalade. The mildness of its operation recommends its use in the reflex constipation caused by painful *hæmorrhoids*, in which case it may be combined with sulphur, as in the official confection, or it may be given with marmalade.

R. *Potassii Bitart.* ʒj.
Conservæ Aurantii (Keiller) ʒiv.
Sulphuris Præcip. ʒss. *Misce.*

Fiat electuarium, cujus capiat cochleare magnum omni mane nocteque.

Potassii Carbonas resembles in action the liquor potassæ. It is corrosive to some extent, and a large dose in concentrated solution causes death by destroying the tissues with which it comes in contact, though its effects are not so severe as are those following caustic potash or the liquor. It is seldom given in medicine, the bicarbonate possessing all its virtues without its irritative qualities. It is eliminated as carbonate in the urine.

Potassii Bicarbonas.—This salt possesses all the virtues of the potassium compounds, without any local corrosive or irritative action. It is a mild antacid; given in small doses, it stimulates the secretion of the gastric juice before taking food, and thus may sometimes prove beneficial in *atonic dyspepsia*. In *painful gastric affections*, accompanied by excessive secretion of acid and acrid fluid after meals, if administered in large doses it counteracts acidity, and often gives instant relief, though its continued administration in such cases is not productive of permanent benefit. In *gastralgia*, not evidently depending upon excess of acid secretion, the bicarbonate relieves by its local soothing or sedative action, possibly by giving off carbonic acid gas as it comes in contact with acids, but it is inferior to the corresponding soda salt.

It renders the blood more alkaline, and is excreted as carbonate by the kidneys, which it stimulates. Passing over the

mucous membrane of the genito-urinary tract, it either exercises its direct sedative influence, or else, by rendering the urine less irritating, it soothes the inflamed surfaces in *cystitis*, *gonorrhœa*, *pyelitis*, etc. It may well be combined in such cases with buchu, pareira, or hyoscyamus. If the urine be already alkaline and decomposing, causing irritation by the rapid formation of ammoniacal compounds in the bladder, the potassium salts do harm. If the irritation be caused by the presence of an abnormal amount of uric acid, then the bicarbonate gives relief.

There is much difference of opinion about the value of alkalies in *acute rheumatism*; but though it is unproven that this treatment possesses the power of cutting short the disease, it was a well-recognised fact before the introduction of salicylates that the alkalies afford relief in this affection. It is possible that the beneficial effects of the drug do not depend upon its neutralising the supposed excess of acid in acute rheumatism, but from its so altering the composition of the blood that the changes in this fluid, caused by the rheumatic poison, are less easily effected.

In *gout* this salt has been long vaunted upon the theory that as it forms more soluble salts than soda does with uric acid, it prevents or causes the absorption of gouty concretions, but there appears to be a steady reaction setting in against the free use of alkalies in this condition, and the writer has of late years witnessed some cases where their administration increased all the symptoms and signs of the disease.

In *rheumatoid arthritis* and *chronic rheumatism* benefit is often found from the free administration of the bicarbonate if combined with the iodide of potassium.

It should be remembered that the alkalies, when given for a long time in medicinal doses, cause deterioration in the quality of the blood and diminish the weight of the body; and thus a tardy convalescence may result after the disease for which they are administered has been cured.

The best form in which to give the bicarbonate of potassium is effervescing with lemon juice, one tablespoonful of which will be found to neutralise 25 to 30 grs. of this salt; but the alkali or acid may be in any excess that the physician considers his case demands. (See R. on page 305.) A solution of citric acid may be used as a substitute for fresh lemon juice, but the natural juice is always to be preferred.

Potassii Bichromas formerly was used for its supposed alterative action in *syphilis*; it is still occasionally prescribed in painful *dyspepsia* and *gastric ulcer* in doses of $\frac{1}{8}$ gr. in pilule; 2 or 3 grs. act as an emetic. A saturated solution is employed as a caustic, brushed over *superficial growths*, especially of a syphilitic character. A peculiar ulceration of the hands, face,

and septum nasi attacks persons working with this drug. The ulceration does not come on unless there has been a previous abrasion.

Potassii Bromidum and Iodidum. (See under Bromum and Iodum.)

Potassii Chloras.—The greater part of this salt passes unaltered through the system, and its irritating effects are due to the acid with which the base is combined.

Binz and Mering have demonstrated that a portion of it is reduced by decomposing fibrin and septic tissue, with the evolution of free oxygen, and most authorities are satisfied that some portion of it is decomposed in the body, though all agree that it cannot act as a general oxidising agent in the sense formerly attributed to it. Coghill believes that it oxygenates the blood by its mere catalytic action, and Henderson demonstrated that it relieved the dyspnoea felt in climbing the high passes in the Himalayas.

In moderately large doses (20 grs.) it stimulates the kidneys as it is excreted by them, and the greater proportion of the dose appears in the urine. In poisonous doses (1 oz.) it causes active congestion of these organs, with bloody and finally suppressed urine. Death may take place in a few hours from the change of the blood pigment into methæmoglobin, which stable compound refuses to part with its oxygen to the tissues, and the corpuscles are destroyed. Sometimes heart failure and gastro-enteritis supervene.

It is, however, for its local influence over *unhealthy mucous surfaces* that this remedy will always keep a high place in therapeutics. This effect is witnessed when a solution is applied to the *spongy gums* in various *aphthous conditions* of the mouth and throat, and in active *inflammations* of the *tonsils* and mucous lining of the *pharynx* and *nares*. A rational explanation of its action in these cases has yet to be given, and we must fall back upon such a term as "alterative" to explain its beneficial effects, for it seems by its local influence to alter in some way the unhealthy action of the membrane. One effect may be constantly observed when chlorate of potassium is used as a gargle in *follicular pharyngitis* or *acute tonsillitis*. Marked benefit at first follows its use, but if it is persevered in for any length of time, it keeps up a chronic irritation, which subsides only after its use is withdrawn. It appears to have an influence over the salivary and buccal glands, like what it has been observed to exercise over the mammary—viz., it checks or moderates their secretion if excessive, and stimulates or increases it if scanty. It has been highly spoken of in excessive salivation from the injurious use of *mercury*.

A solution of about 6 grs. to each fluid ounce of distilled

water is a satisfactory application to *unhealthy sores* and *ulcers*, and may be used for washing out foul *sinuses* or *cavities*. The powdered salt may be applied to *aphthous* spots on the *cheeks*, *tongue*, or *gums*, and has been found to alter the action, diminish the pain, and check the growth of *epithelial cancers*. Small pieces sucked in the mouth, by reflex action, excite the secretion of healthy mucus in chronic *bronchial* and *laryngeal affections*, so that the expectoration is rendered more fluid or less adhesive, and is readily swept up by the cilia; hence this salt is classed as a ciliary excitant.

After its absorption and entrance into the blood it appears to exercise, but in a much feebler degree, the same alterative, stimulating, or regulating power over other mucous surfaces, especially the intestinal. In diseases of *childhood*, depending upon *catarrhal* and other *unhealthy inflammations* of the *mucous membrane* of the *alimentary canal*, from the mouth to the anus, the writer has found this drug invaluable. It is an expectorant in *bronchitis*, and has been reputed to act as an alterative in *scrofula*.

Dr. Harkin pointed out its usefulness in *purpura hæmorrhagica*, *epistaxis*, *hæmaturia*, and a host of blood ailments.

The following is a useful combination :—

R. *Potassii Chloratis* ʒiij.
Tincturæ Ferri Perchlor. ʒj.
Glycerini ʒvj.
Aquam Destill. ad ʒxij. *Misce.*

Fiat mistura, cpt. ʒi. ter in die.

Potassii Nitras.—The salts of potassium, with the mineral acids, act like the chlorate, and differ from the vegetable acid salts of potassium in passing through the system and being for the most part eliminated unchanged in the urine, whilst the latter are converted into carbonates.

The nitrate is a very active substance; it rapidly enters the blood, and in large doses prevents its coagulability by its action on the fibrin. It so alters the red blood corpuscles that they soon cease to possess any power of carrying oxygen to the tissues. The first effect upon the heart is to render it slower in its movements; afterwards it becomes quick and weak, and finally stops. Death may result from the violent irritant action of the salt on the alimentary canal, giving rise to severe vomiting and purging.

The salt is eliminated by the kidneys, during its passage through which it acts as a stimulating diuretic, appearing in the urine as nitrate. The skin is acted upon, this salt possessing very constant diaphoretic powers, which are increased if it be administered in some hot fluid at bed-time. A glass of whisky or brandy, with boiling water and sugar and $\frac{1}{2}$ dr. of

the nitrate, affords a good chance of getting the hot skin to secrete abundant moisture in *febrile affections*, whilst it slightly reduces the pulse, and the temperature falls a little.

Brunton recommends nitre as a means of lowering arterial tension in the aged, especially when combined with small doses of the nitrite of soda.

The refrigerant action of nitre is generally explained by its sedative influence on the circulation and its effect upon the skin. It is a diaphoretic and diuretic in all *inflammatory affections*, except where the gastro-intestinal or renal apparatus is involved. It is, probably, partially excreted by the bronchial mucous membrane, over which it appears to exercise an influence not unlike that which it effects on the skin, and it is a reliable expectorant when the irritation or inflammation is confined to the *trachea* or *larger divisions* of the *respiratory tract*. Bibulous paper soaked in a strong solution of nitre, dried, and allowed to burn slowly in the patient's room, has long been a favourite remedy in *asthma*.

The nitrate may be given with great advantage in a mixture of the citrate or bicarbonate in effervescence.

Potassii Permanganas is a powerful oxidising agent, readily parting with its oxygen, which, on being freed, forms harmless compounds with foul-smelling gases and liquids, thus acting as a very efficient deodoriser. In a similar way it destroys the germs of disease, and thus is a disinfectant. It makes an elegant and not unpleasant gargle in *fetid ulcerations* about the *gums, mouth, or throat*, in the proportion of about 2 grs. of the salt in 10 ozs. of distilled water. This weak solution may be also used as a lotion to *suppurating sores*, or as an injection into suppurating *cavities* and *sinuses*, as in *ozæna* and *empyema*, or as an injection in *cancer* of the *os uteri*. Applied in the powdered state, or in 1 in 50 solution, it sometimes gives excellent results in *lupus*. 1 gr. to 2 ozs. water makes a most valuable application to *burns, scalds, and frost-bites*. It should be prescribed with distilled water, and kept in stoppered bottles, or given in the form of pill (page 35), as it so readily parts with its oxygen. It is decomposed in the stomach before absorption, and cannot possibly exercise any oxygenating power in the blood and tissues.

As an antidote in poisoning by morphine, cyanides and phosphorus it is invaluable, and a lethal dose of morphine may be swallowed with impunity if a few grains of the permanganate in solution be administered immediately after. The stomach should be washed out with it at intervals during the treatment of opium poisoning.

The writer has found better results from an injection of this salt ($\frac{1}{2}$ gr. to 1 oz.) in *gonorrhœa* than from any other local remedy. It is very valuable (1 gr. to 1 oz.) in *gleet*.

It has been given in grain doses in *diabetes*, and has been very highly extolled as a specific in *amenorrhœa* or *scanty menstruation*, given in 2 gr. pills; the writer has not been successful with it.

It has been used to counteract the poison of *snake-bites*, and F. E. M'Farland has recommended it strongly in *cholera*.

Potassii Sulphas is used to effect the minute sub-division of the particles of powders and pill masses. It is a mild cathartic, acting by increasing the intestinal glandular secretion; and is especially suitable for children. The experiments of Rutherford prove that it is a decided hepatic stimulant.

Prunum.—The dried plum is seldom employed as a medicine, but it is freely used in domestic life as a food and sweetmeat. It possesses faint laxative properties, and when stewed makes a tempting dish for constipated children. It probably acts by increasing peristaltic action.

Prunus Virginiana.—Wild Cherry Bark is a bitter tonic, acting on the mucous membrane of the stomach as a slight irritant, increasing its vascularity and secretion, like the older bitters, calumba, etc. This action is, however, somewhat antagonised by the tannin contained along with the bitter extractive, which at the same time confers *astringent* virtues upon the remedy. It contains also amygdalin and emulsin, which give a percentage of Prussic Acid in the liquid preparations that confers *sedative* properties upon them.

The syrup is given in teaspoonful doses to allay the cough and sweating of *phthisis*. The tincture in $\frac{1}{2}$ dr. doses is a tonic in convalescence from acute diseases, and is useful in *dyspepsia*. Allbutt found the drug useful in cardiac *palpitation*, *mitral regurgitation*, and in *chronic bronchitis* with *fatty heart*, but its feeble properties do not justify its retention in the B.P.

Pterocarpi Lignum has faint astringent properties depending upon traces of tannic acid which it contains. It is used solely as a colouring agent in Tinct. Lavand. Co.

Pyrethri Radix, when chewed, acts as a powerful stimulant to the salivary glands, causing a sudden increase in the quantity of saliva by its direct irritant action. It has been thus used to relieve the pain of *carious teeth*, and as a masticatory in *paralysis* of the *tongue* and relaxation of the *uvula*. Its pain-relieving properties are very uncertain, though the tingling and unpleasant sensation which it causes in the mouth will always to some extent mask pain; and it appears to blunt the sensibility of the nerves distributed to the lining membrane of the mouth. Internally, it has been given in *globus hystericus* by Roth, who reports very favourably of it. He believes it acts by stimulating the sympathetic.

The writer has employed it with success as a rapid method

of having *iodide of potassium* eliminated from the system in *chronic poisoning* by that drug.

The tincture may be used as a *mouth-wash* in the proportion of a teaspoonful to a wineglassful of water; or it may be applied in its undiluted state on cotton-wool to the cavity of the diseased and painful tooth.

Pyroxylin is only employed in making Collodion.

Quassia is a pure bitter tonic, devoid of astringency; it is used in *dyspepsia* and *anorexia*. It closely resembles calumba (which see), and, like it, may be given with the preparations of iron, since it contains no tannin.

It possesses toxic properties when eaten by flies and fish, and has been supposed to act in a similar way in various diseased conditions of the blood, destroying unhealthy organisms, and acting as a true febrifuge, like quinine, but only very doubtful success has resulted when thus administered, possibly because too small a dose has been used. When injected into the rectum a strong infusion will cause the death of the *thread worm*.

R. *Infus. Quassiae* ʒxj.

Tinct. Quassiae ʒvj.

Tr. Ferri Perchloridi ʒij. *Misce.*

Fiat mist. cujus capiat cochlearia duo amplā ter in die.

Quillaia contains sapotoxin and saponin—glucosides resembling the active principles of senega, but it is a more powerful expectorant than senega, and much more irritating. It is indicated in *emphysema* and *chronic bronchitis*, but not in hæmoptysis. (See Senega.) It contains five times as much saponin as senega, and may be used to make emulsions. The sapotoxins are all powerful protoplasmic poisons, causing violent gastro-enteritis and blood destruction. Trechinski has found quillaia of great service in acute and chronic catarrhal *rhinitis*. He directs the patient to shake up the powdered bark in a paper bag, and breathe the dust arising from it. It has been reported as valuable in *amenorrhæa*. Kobert shows that saponin is a mixture of a harmless substance—lactosin—with sapotoxin, a dangerous blood poison, which breaks up the blood corpuscles. Shoemaker has used soap bark with success as a local stimulant to *chronic ulcers* by applying bandages soaked in an infusion. It is used as a lotion to the scalp in *dandruff* and *seborrhæa*, and raises a free lather like ordinary soap.

Quinine. (See under Cinchona.)

Resina is not administered internally; it is used solely for its adhesive property and for making various fatty mixtures of suitable consistence for ointments. It is freely used as an ingredient in most of the household soaps now manufactured.

It has, however, feeble stimulating qualities, and is much used when made into an ointment with wax, lard, and oil as a mild stimulant to *sluggish ulcers* and *slowly healing wounds*; it appears to act in such cases by causing enough irritation to slightly increase the blood supply; at the same time it protects the ulcerated or wounded surface from the action of the atmosphere. (See also under Rosinol.)

Rhei Radix.—Rhubarb is one of the anthracene group of purgatives; when administered in small doses (2 to 5 grs.) it acts as a stomachic, increasing the quantity of the gastric juice, improving the appetite, and assisting digestion; the tincture has been long used for this purpose. Rhubarb soon finds its way into the blood, and, acting as a stimulant to the liver, or to that portion of it whose duty it is to secrete bile, it increases the quantity of this fluid without diminishing any of its ingredients, and the cholagogue action of rhubarb is independent of any cathartic action.

In 20 gr. doses it produces mild purgation, probably by stimulating the muscular movements of the intestinal tube from the duodenum to the rectum. It also acts, though to a small extent, as a mild stimulant to the intestinal glands, and slightly increases their secretion. In doses of 60 grs. the intestinal fluids are considerably augmented.

Rhubarb after exercising its cathartic power becomes an astringent, and checks the alimentary secretions, causing subsequent constipation, owing to the rheo-tannic acid which it contains, and consequently it is not a suitable purgative for patients suffering under chronic constipation. This renders it valuable in *diarrhœa* when we wish to produce an astringent effect after getting rid of some irritating food or matters remaining in the canal.

In *hæmorrhoids* few remedies will be found so useful as rhubarb, and some consider it much more efficacious if slowly chewed in the mouth; but in any case its only disadvantage is its astringency, which is entirely counteracted by tablespoonful doses of olive oil taken every night, floating on a little milk.

The stools are at first darkened, owing to the increased bile and colouring matter of the rhubarb; they afterwards become pale. The colouring matter consists of chrysophanic acid, and is found in the perspiration, milk, and urine, but chiefly in the latter. Hence the drug has been tried in *psoriasis*, but without success.

An equal quantity of bicarbonate of sodium is said to overcome the astringent properties of rhubarb and disguise its taste; and it may be so ordered as a powder in teaspoonful doses in water.

It should be ordered with some substance like magnesia, as in Gregory's Powder or Pulv. Rhei Co., which may be given in

milk, and is an invaluable cathartic in the various *gastric* and *abdominal* troubles of *childhood*. The syrup is well suited for children, the coriander partially concealing the flavour.

The following form will be found a good one for producing the stomachic effects of rhubarb, though some prefer to substitute peppermint for the spirit of anise ; or the official compound powder may be given in a mixture— $\frac{1}{2}$ oz. rubbed up with $9\frac{1}{2}$ ozs. of Aqua Menthæ Viridis and $\frac{1}{2}$ oz. of Spiritus Ammoniaë Aromaticus :—

R. Pulv. Rhei ʒiss.
Syrupi Simp. ʒj.
Spt. Chloroformi ʒiij.
Spt. Anisi ℥. xxxv.
Aquæ Carui ʒviss. Misce.

Fiat mistura. Signa.—"A small tablespoonful as a tonic or stomachic, or a wineglassful as a purgative."

Rhœados Petala possess very feeble narcotic qualities. Though it is impossible to get any traces of morphine when submitted to chemical examination, still the characteristic effects of opium have been noticed when the syrup has been given to *infants*. It is only used for its colouring properties.

Ricini Oleum is the mildest and safest official cathartic. In small doses it acts as a laxative ; seldom is it necessary to prescribe more than half the maximum B.P. dose. The intestinal glands are slightly stimulated, and the vermicular contractions are increased in frequency and power, especially in the duodenal part of the canal, the result of which is, that in about six hours several very soft but not watery stools are passed with little pain and no constitutional disturbance. The oil passes out by the bowel ; it may be recognised in the secretion of the mammary gland by its purgative effects upon the infant.

The active principle of castor oil is ricinoleic acid existing in the form of a glyceride. The acid is set free by the pancreatic secretion and bile, and acts as a stimulant or mild irritant, the portion of the oil which escapes decomposition acting as an emollient as it passes downwards towards the anus and preventing griping. This fact explains how 1 or 2 drs. often act as efficiently as an ounce of the drug.

The seeds from which the oil is extracted are poisonous, containing a virulent irritant—or toxalbumin, known as Ricin, one of the strongest of the vegetable poisons, which causes death when injected into the veins by producing gastro-enteritis and intestinal hæmorrhages. *None of this substance exists in the oil.* It appears to the writer to resemble the poison existing in the uncooked haricot bean, and like it, is rendered harmless by cooking. The interesting fact is that

animals rapidly become immune after injections of this active poison, so that many thousand times the lethal dose can be administered with impunity, and this was demonstrated by Ehrlich to be owing to the formation of an antitoxin in their serum. (See Antitoxins.) The oil possesses no power over the hepatic secretion, and appears to lose its influence after a time; and in some cases its administration seems to be followed, like rhubarb, by an astringent effect. In *pregnancy*, where it is a very safe purgative, large doses may be required if regularly and constantly employed; and it is strange that sometimes in these cases if the large dose (1 oz.) be withheld, and only one or two teaspoonfuls given, the drug appears to regain its power, and to purge freely; it has also nutritive virtues.

Its bland qualities render it a favourite and safe purgative for *young children* and *infants*, and in all cases of *pelvic inflammation* in adults. In the *diarrhœa* of infancy it is a prized medicine, acting by safely causing the expulsion of all irritating matters.

In *æcal accumulations* castor oil has long held a high reputation; but it should not be depended upon without the aid of enemata of large quantities of warm water. Accumulations of the rinds of fruits (especially of gooseberries), so often found in children, are not so efficiently expelled by castor oil as is supposed. More energetic cathartics are required, and calomel or senna is especially useful in such cases.

A drop of castor oil allowed to fall upon the *conjunctiva* is a soothing protective when a foreign body is present. This emollient action upon the sensitive nerves of the eye is in marked contrast to its stimulating action on the bowel, and is easily explained by the fact that the oil is inert till its ricinoleic acid is set free by the alkaline secretions met with in the duodenum. Hence when the oil was previously saponified by alkalies, as in the old B.P. mixture, much gastric irritation resulted.

The unpleasant flavour and sickening, greasy taste of castor oil is a great hindrance to its use. If ordered alone, it may be administered when it reaches the sick chamber by floating it upon a little wine or spirit in a glass, after which it should be bolted quickly; some patients take it in orange juice, coffee, water, or gruel.

Directions are frequently given to float the dose between different strata of liquids. Perhaps the best of all methods is to pour some *thick* cream into a very clean wineglass, turn it round, so that the sides get smeared well over, pour in a table-spoonful of castor oil, and a little cream on the top. The patient, having taken a teaspoonful of cream into his mouth and caused it to come into contact with his palate by the movement of his tongue, is directed to swallow at a gulp the oil and cream out of the wineglass, throwing back his head,

that they may more readily pass over the tongue. Castor oil should be *gently* warmed before being administered, as it is rendered thus more liquid and less adhesive. The essential oil of bitter almonds conceals its smell, and it can also be easily administered in a little fresh lemon juice, or in capsules.

☞ When the oil is administered very early in the morning (4 to 5 a.m.), the secretions of the mouth are so dried up that often the taste of the drug cannot be recognised.

A favourite combination is $\frac{1}{2}$ oz. dose of castor oil with 10 to 20 mins. of tincture of opium to prevent griping.

Children bear large doses well, and a small teaspoonful is administered to newly-born infants without producing unpleasant effects. As a rule, never more than $\frac{1}{2}$ oz. should be administered for the first time to an adult.

1 or 2 ozs., with as much mucilage of starch, may be injected into the rectum.

Rosæ Gallicæ Petala possess faint astringent properties, owing to the traces of tannin which they contain. They are only used for their colour.

The infusion made with dilute sulphuric acid and water is an elegant method of administering the mineral acid, and may be made the basis of many agreeable mixtures. Its activity depends upon the tonic and astringent properties of sulphuric acid, and it may be freely given in the *sweating* of *phthisis*, and as a gargle in *relaxed sore throat*. Dilute nitric acid may be substituted for the sulphuric.

Rosæ Oleum.—Otto of rose is only employed for its fragrance, though some believe that in eye-washes and gargles rose-water exercises a soothing influence.

Rosmarini Oleum is a powerful carminative and stimulant when taken internally (which is seldom); it acts like peppermint.

Externally, it is a valuable rubefacient, and is much used as an application to the *scalp* in *baldness*, where it is commonly supposed to improve the nutrition of the hair-bulbs, by increasing the supply of blood to the skin. Its efficacy is greatly increased by combining it with cantharides. It is often added to liniments on account of its odour.

The following is a valuable remedy for *baldness* :—

R. *Olei Rosmarini* ℥iv.
Liq. Epispastici ℥ij.
Olei Amygdal. Dulc. ℥iiss.
Spt. Camphoræ ℥ij.
Glycerini Boracis ℥j.
Olei Rosæ gt. viij.
Tinct. Jaborandi ℥j. *Misce.*

Signa.—"A little to be rubbed into the roots of the hair every night."

Saccharin. (See Glusidum, page 388.)

Saccharum.—Sugar as a food possesses well-known properties; it is a nutrient to the adipose tissue of the body and a respiratory fuel. It is used in pharmacy for a variety of purposes, but the physician only orders it to sweeten mixtures or to assist by its density in the suspension of powders.

Saccharum Lactis, owing to the hardness of its particles, is employed to effect the minute sub-division of the particles of substances in powders or pills, and thereby to increase their efficacy and insure their equal distribution in each dose.

It resists fermentation, and is given instead of cane sugar to sweeten the food of *dyspeptic* infants, and for a similar reason it has been given in various *irritable conditions of the stomach*, and as a food in some *wasting pulmonary diseases*.

It has been demonstrated to be a valuable diuretic, greatly increasing the flow of urine in *cardiac dropsy*. It acts as a diuretic in albuminuria, but not so markedly. There is great discrepancy in the doses employed by different observers; these range from 3 drs. to 3 ozs. for a daily dose.

Salicin. (See under Acid. Salicylic., page 310.)

Salol is chiefly employed as an intestinal antiseptic. After administration, it passes unaltered through the stomach, but is changed immediately upon entering the bowel, when it comes into contact with the pancreatic juice, which splits it up into salicylic acid and phenol, and it appears very soon in the urine as sulphocarbulates and salicyluric acid. Ewald measures the rate at which food passes through the stomach by this means. Salol in large doses causes the urine to become greenish-black, and it may produce symptoms of carbolic and salicylic acid poisoning. Nevertheless, it is much safer than proportionate amounts of these acids. Salol has been given in 15 to 30 gr. doses in *fevers* without ill effects. After such a dose there may be noticed a drop in the temperature of 5°. It is in *acute rheumatism* that salol has proved a most valuable drug, and its action is allied to salicylic acid in this disease. Innumerable reports testify to its success in acute and chronic rheumatism, *sciatica*, *neuralgia*, and *lumbago*, *cystitis*, *pyelitis*, and *phthisis*, and it possesses analgesic properties like antipyrine, in *migraine*, *ataxy pains*, etc. Its internal use in putrid conditions of the urine is like that of boracic acid, and prevents the necessity of bladder injections or irrigation. It is used as a duodenal and intestinal disinfectant, and as a solvent for gall-stones, as it liquefies the bile; it is given also in *catarrh of the bile ducts*, and has been used locally as a mouth-wash, and spray, and application to wounds. 12 grs. may be considered a fair average dose, and it may be repeated every four hours; it can be given in tabloids or sus-

pended, in water or in wafer-paper. It is liable to form calculi in the bowel, and these have caused obstruction; hence it should always be triturated and prescribed with some inert powder, as sugar of milk, bismuth, etc.

Externally, it can be used exactly like iodoform, and it was maintained by many that it should replace that drug, but it is now seldom employed in this manner. It contains about 38 per cent. of phenol. Philippson has reported two cases of *general scleroderma* successfully treated by full doses of salol internally.

Salol Camphor is a thick liquid prepared by heating together 2 parts of camphor and 3 of salol. It has been used externally as an antiseptic, and taken internally in small doses. By dissolving 2 drs. salol in 2 drs. ether and 2 ozs. collodion a thick liquid is obtained, which has been painted over the joints in rheumatism with benefit.

Salophen is a body of similar composition to salol; it contains 51 per cent. salicylic acid, and is given in similar doses. It is stated that it is less likely to cause phenol poisoning. It has been successfully used as a hypodermic injection (15 grs.) in *sciatica*.

Sambuci Flores.—The water distilled from elder-flowers does not possess any therapeutic value, though other parts of the plant are by no means inert, for the bark is cathartic and emetic. A decoction of the fresh inner bark is a valuable diuretic, and has been used with success in *acute nephritis*. The water is used as the fragrant basis of lotions, and enjoys the popular reputation of a cosmetic, clearing the skin of freckles.

Santali Oleum is a stimulating disinfectant to the genito-urinary mucous membrane. It closely resembles copaiba in its action, and is used in the treatment of *gonorrhœa* and *gleet*. It acts upon the lining membrane of the bladder and urethra as it is being excreted in the urine. Posner believes that it has a specific action upon the prostatic portion of the urethra.

If it does not act speedily in 20 min. doses on the gonorrhœal discharge, which it generally diminishes in 60 hours, the probabilities are it will not do much good. The administration of the santal oil should be kept up for some time after every trace of the gleet or gonorrhœa has disappeared. It is excreted by the bronchial surface, and has proved useful in *fetid bronchitis*. It may be ordered in gelatin capsules or with mucilage in a mixture, each $\frac{1}{2}$ oz. of which can be made to contain 20 mins. of the oil, with 1 dr. of syrup, 1 dr. mucilage, and 2 drs. infusion of orange. It may be given before, after, or with food. (See also Santalol.)

Santoninum is used to destroy worms in the intestinal canal. It is the best vermicide for the common round-worms—(*ascarides lumbricoides*)—acting speedily and certainly when

properly administered. It also kills the thread-worm, though it appears to have no effect upon the tape-worm.

It kills the worms in doses which do not produce purgation, though it purges if given in large doses, and may cause serious cerebral symptoms. Death has followed the use of the drug in very young children or infants, in whom it sometimes produces convulsions, vertigo, and coma, with purging and vomiting.

Santonin, like many other remedies of its class, produces its effects more certainly if administered after fasting, or after the operation of a mild purge. In castor oil, as pointed out by Kuchenmeister, it acts more satisfactorily than when given in any other way, and the writer can strongly endorse the accuracy of this observation, after seeing its administration in some thousands of instances in the practice of a children's hospital. Unpleasant symptoms were never observed, though the drug was given in full doses ; *the oil appears to lessen very considerably the risk of any evil effects.* To a child two years old 2 grs. may be given at bed-time, mixed with a large teaspoonful of castor oil, and more oil or other purgative administered in the morning if necessary. The worm is generally expelled dead, and it has been stated that the drug acts by causing convulsive movement in the worms, which excites the intestine to expel them.

Some curious effects follow the use of santonin. Yellow vision may be noticed inside an hour after administration ; every object appears yellow or green to the patient, and violet objects are recognised with difficulty, though the humours or solid tissues of the eye are not in any way coloured. The effects appear to depend upon the action of santonin on the delicate retinal fibres. The retinal bloodvessels are always congested. Perversions or alterations in the smell and taste are also occasionally experienced. The urine is very often stained yellow, orange, or red, apparently varying in colour according to the degree of its alkalinity ; and santonin acts as a diuretic, stimulating the kidneys, by which it is eliminated, and it also sometimes renders the bladder irritable. It is supposed to act in the blood in combination with soda. It has been tried unsuccessfully in *nocturnal incontinence of urine*, in *amaurosis*, and for *colour-blindness*. It has been said to remove the discharge in *gleet*, and to diminish slightly the albumin in *albuminuria* ; Chéron lauds it in *dysmenorrhœa* and *amenorrhœa*. It has been discovered to have analgesic action in small doses, and has been found to relieve the pains in ataxia. It has also been recommended in epilepsy when bromides fail. When given to *young animals* santonin produces cataract.

It may be given in the form of a lozenge or as a powder, with a little calomel, or in olive oil, to those who cannot bear the taste of castor oil ; or it may be given in a suppository.

It may be dusted in fine powder over a slice of bread and butter, and is thus readily eaten by children.

For Santoninoxim, the non-poisonous substitute for santonin, see the Non-Official Remedies.

Sapo Animalis, Durus, and Mollis are introduced into the B.P. as excipients for pill masses, and as vehicles for liniments and plasters.

Soap, however, possesses other valuable qualities. Thus, it is an antacid, and, acting like the alkalies, will counteract an excess of acid. It can be so easily given in the pilular form that we can manage to have its alkaline effect produced at that part of the canal which the more soluble alkalies generally do not reach. It may act as a restorative by supplying to the bile some salts which are natural constituents of that fluid. At the same time it may assist in the emulsifying process going on in the duodenum, and, added to purgatives like aloes and jalap, it mitigates their acrimony, and at the same time quickens their operation; and this is frequently explained by pointing out the *solvent* power of soap over these bodies. Large doses of soap have been recommended as a solvent for *gall-stones*.

It acts as a laxative when swallowed or introduced into the rectum, and this latter action of soap affords one of the most simple and convenient methods of emptying the lower bowel. In the case of infants, a thin, wedge-shaped piece of ordinary hard soap may be introduced through the anus for an inch or more, and held there for a few moments. By its irritation, reflex action is aroused, causing the contraction of the rectum and often of the entire colon. In adults, a small plug as large as the last joint of the index finger may be inserted like a suppository, and allowed to remain till expelled.

Externally, the cleansing properties of soap are well known, and it should be remembered that it often irritates *eczema* and prevents its cure, whilst sometimes, in sluggish cases, it may act as a healthy stimulant. By far the least irritating soaps made are the superfatted soaps like Vinolia, and these should be recommended for use by eczematous subjects.

The liniment of soap is a valuable remedy in *sprains*, *bruises*, and *stiffness of joints* from inflammatory effusion; its action in such cases is called "discutient." It removes the swelling by stimulating the absorbents, and requires friction in its application. The plaster is supposed to act in the same way, but it probably possesses no specific action beyond the support and pressure which it affords, at the same time giving the affected surface somewhat of the benefits of an internal part.

Sarsæ Radix.—About this drug very different opinions prevail, some authorities condemning it as absolutely inert, while many physicians firmly believe in its virtue as a diuretic,

diaphoretic, and antisymphilitic. It is probable that the *fresh* root possesses properties which render it of value in the treatment of *secondary* and *tertiary syphilitic affections*, various *skin diseases*, etc.

The dried root produces no appreciable therapeutic effects. The compound liquor may prove of some value, as there are three ingredients contained in it which possess well-recognised tonic and diaphoretic properties. Zittmann's Strong Decoc-tion contains mercury, and finds favour with some physicians as a remedy in chronic syphilis.

Sassafras Radix is generally classed as a stimulant and diaphoretic; the oil produces the effects of a mild stimulant, acting upon the vascular and nervous systems.

The drug is often employed for its flavour, and it gives diaphoretic qualities to the compound liquor of sarsaparilla.

Scammonium and its resin resemble jalap very closely in their action. They are powerful drastic purgatives, producing their effects by their *local* irritative action on the bowel, causing in about four or five hours the evacuation of the contents of the colon in a semi-solid form, soon followed, with much griping, by liquid stools. 5 grs. of the resin, or 10 of the gum-resin or scammony, are a fair dose for an adult; but this drug should be given in combination with some purgative which would assist its action and diminish the griping. The best way to achieve this object is to combine it with calomel.

It is indicated where the thorough evacuation of the contents of the bowel is desired, as in *impaction of fæces*, or where a quantity of serous fluid is required to be removed from the blood, as in *head injuries* and *dropsies*.

It appears to act more promptly when given with an alkali, and soap answers this purpose well; the drug does not act in the absence of bile, and it is the soda of this secretion which assists its action; sulphate of potassium corrects its griping.

Though a powerful stimulant to the intestinal glands, it has but a very feeble effect upon the liver.

Scammony was formerly much used as a remedy for the various forms of *parasites* infesting the alimentary canal, especially of children. There is, however, no evidence to show that it acts as a true anthelmintic, since its beneficial results in such cases appear to be easily explained by its irritant purgative qualities.

R. *Scammonia Resina* gr. x.

Hydrarg. Subchloridi gr. vj. *Misce*,

et divide in pulv. ii. st. i. statim.

Scilla.—Squill acts as a cardiac tonic, expectorant, emetic, and diuretic; in large doses it is a violent irritant poison,

causing death by its action upon the gastro-intestinal mucous membrane, giving rise to vomiting and purging and severe inflammation of the mucous tract. These effects are noticed in a more or less marked degree, whether the drug be swallowed, applied to the broken skin, injected into a vein or into a serous cavity, or under the skin. In its action it closely resembles digitalis, but it is more irritating to the stomach and bowels, and it has valuable expectorant powers which digitalis has not. It is excreted by three outlets—by the bowel, acting as a mild purgative; by the kidneys, which it stimulates, producing diuretic effects; and by the pulmonary mucous membrane, whose secretion it liquefies, thus acting as an expectorant. It is for this last effect that squill is ordered most frequently, and it may be well combined with ipecac. The syrup and the oxymel possess reliable expectorant powers in the *chronic bronchial affections of childhood and infancy*, in 10 min. doses. It is rarely used alone as a diuretic, but is generally given with digitalis and mercury. (See page 379.)

Its use is indicated in *chronic catarrhal affections* with profuse *tough* expectoration, and in *dropsies*, in the absence of any inflammatory state of the stomach, bowel, or kidneys. It is especially useful in *cardiac dropsy*.

AS AN EMETIC FOR A CHILD ONE YEAR OLD.

℞. *Syrupi Scillæ*
Vini Ipecac. ana ʒj. *Misce.* ☞

St. ʒi. omni semi-hora ad effectum.

20 drops may be given every three hours as an expectorant.

The active principles Scillain or Scillitoxin and Scillipicrin are powerful cardiac poisons, and possess no advantages over the safer glucosides found in digitalis.

Scoparii Cacumina.—Broom is a safe diuretic, resembling uva ursi, and in some respects digitalis. In large doses it is an irritant to the gastro-intestinal mucous membrane, producing vomiting and purging, though only to a slight degree. It is given in cardiac and chronic renal dropsies, where no active inflammation of the kidney is present. Sparteine, the active principle of broom, has been found to possess properties of a cardiac tonic nature, like digitalis, to which, however, it is much inferior, since it fails in strengthening the ventricular contraction, though it raises the blood pressure and slows the rhythm. (See Sparteine in the Non-Official Remedies.)

℞. *Succi Scoparii* ʒiv.
Tinct. Digitalis ʒiv.
Spt. Æther. Nitrosi ʒiss. *Misce.*

Fiat mis ura, capiat ʒij. sextis horis ex aqua.

Senegæ Radix is an expectorant acting upon the bronchial mucous membrane, over which it exercises a stimulating influence. It is given in *chronic bronchitis* and *emphysema* when there is *profuse* adhesive discharge. Some authorities explain its effects as depending upon a stimulating action on the respiratory centre or efferent nerves, which causes continual coughing, thus keeping the tubes clear and preventing the accumulation of mucus. Others believe that it acts as a tonic to the muscular tissue in the bronchial tubes, thereby facilitating the expulsion of their contents. Its action is greatly increased by carbonate of ammonium.

It causes a warm acrid sensation when chewed, and increases the salivary secretion; in large doses it is an emetic, and may cause purging. It does not increase the amount of urine in health, but, like digitalis, it augments it in diseased conditions of the kidneys or heart. Its active principle, identical with saponin, is a powerful cardiac poison antagonistic to digitalis.

The tincture emulsifies fats and oils in quantities so small that its medicinal action may be left out of consideration; thus, 3 mins. will emulsify $\frac{1}{2}$ oz. of fixed oil.

The following is one of the most popular combinations for chronic bronchitis:—

R. *Tinct. Senegæ* ℥ss.
Tinct. Camph. Co. ℥ss.
Ammon. Carb. ℥iss.
Infusi Senegæ ℥vij. *Misce.*

Fiat mistura, capiat cochleare magnum quartis horis.

Senna is a purgative, like aloes, cascara, and rhubarb, belonging to the anthracene group. Entering the blood, it produces its effect upon the bowel, and it has been supposed to act in the same manner whether administered by the mouth or injected into a vein. Stockman, however, injected poisonous doses without producing any results. The small intestines are stimulated by it, and both their secretion and movements are increased (perhaps its main action is due to the exaltation of the peristalsis); it produces thin but not watery motions, generally accompanied by considerable griping pain. Senna, when administered to nursing mothers, appears in the milk, and invariably gripes the infant.

Senna should be combined with aromatics to correct the griping; the compound mixture is a valuable method of administering the sulphate of magnesium, the senna increasing peristalsis, whilst the five or six carminatives contained in it check griping. Senna is said to be a chief ingredient in Tamar Indien, which is a valuable purgative.

It is a safe *purgative* for *children*; though causing severe griping pain, ill effects are rarely seen to follow large doses.

In *dyspepsia* and *obstinate constipation* the infusion in a wineglassful dose, to which a tablespoonful of the tincture is added, makes a powerful purgative. It acts, according to the experiments of Rutherford, slightly as a stimulant to the liver.

The syrup is an elegant, though very uncertain purgative for young children, and it may be used as the vehicle for almost any medicine ordered as a powder. 2 grs. of grey powder given in a teaspoonful of syrup of senna is a very palatable purgative and cholagogue.

The confection is a mild and safe laxative, suitable in most cases of *chronic constipation* when given in teaspoonful doses.

The compound powder of liquorice owes its purgative virtues to senna, and is a safe, palatable, and efficient cathartic suitable for children and adults. St. Germain's Tea—*i.e.*, 30 grs. Senna leaves, 15 grs. Elder flowers and Anise fruits, with 8 grs. Cream of Tartar and Fennel fruit, infused in a cup of boiling water, is a palatable method of giving senna. The legumes or fruits of senna are also actively purgative.

Serpentariæ Rhizoma.—Snake-root is a doubtful tonic, possessing feeble aromatic properties. Small doses increase the appetite and promote digestion by mildly *stimulating* the mucous membrane of the stomach. Large doses produce irritation in the stomach and bowel, as evidenced by nausea and diarrhœa.

It was employed in *dyspepsia* arising from want of tone, or atrophy of the gastric tubules, and its supposed stimulating properties have obtained for it some repute in low febrile conditions, as in *typhus*, *typhoid*, *diphtheria*, and *rheumatism*. It is supposed to act in *gout* like guaiacum.

Snake-root does not, as once believed, possess any value in the treatment of *rabies* or *snake-bites*, nor is there any evidence of its emmenagogue or diuretic properties, and it is to be regretted that this comparatively worthless drug is still retained in the B.P., where it has got several preparations.

Sevum Præparatum.—Suet is a well-known fat and a nutritious article of diet, but it is introduced into the Pharmacopœia solely for its physical qualities.

Sinapis.—Mustard acts as an emetic in cases of poisoning, when a tablespoonful stirred up in a tumblerful of luke-warm water may be administered, and warm water freely swallowed afterwards. As a condiment it is supposed to increase the appetite, though the gastric juice is not markedly increased by its local action. The active principle—the essential oil—does not exist in the seeds, but is formed on the addition of cold water to them (see page 280).

Externally, mustard is the best counter-irritant for general purposes; it differs from cantharides in the rapidity and amount of pain attending its action. When applied to the

skin, mustard quickly causes a flow of blood to the vessels of the part, and if its application be continued too long, inflammation of the skin, vesication or ulceration may follow.

A sinapism may be spread on a variety of fabrics, and covered with tissue paper, muslin, cambric, etc., but every requirement is met by the following rapid, cheap, and convenient plan :—

The required quantity of mustard is put into a large cup (about a tablespoonful of mustard makes a fair-sized sinapism) and as much *cold* water is poured upon it as will make a soft uniform cream, not quite so fluid as to flow or pour readily out. A sheet of paper is procured of such thickness as will readily permit the fluid part of the cream to soak through it, without becoming too easily torn. Old newspaper is the best texture for this purpose, and it should be laid out upon a table or smooth surface, the mustard cream turned out of the cup, and roughly smeared or spread over its centre. The circumferential or clean parts of the paper are folded over this, making the required shape and size of the sinapism, which is lifted off the table, and the surface which was undermost applied direct to the patient's skin.

It will be observed that the mustard does not thus come in contact with the skin, but only its moisture, which soaks through, the paper being between the skin and the cream. The sinapism should be kept in contact with the patient's body by a bandage or pad of flannel for 15 to 30 minutes. In the case of children, the mustard before being moistened, should be mixed with from 1 to 4 parts of wheaten or corn flour to dilute it. Often the question is asked the young practitioner, How long should such an application be permitted to remain? This is difficult to answer, and he should direct that, after a few minutes the edge of the sinapism be raised and the redness of the skin noticed. If it remains scarlet for a few minutes the application should be removed, but if the redness is only temporary the sinapism should be kept on longer.

A mistake is made in directing the surface to be immediately covered with cotton-wool, greased linen, etc.; it should first be always wiped dry and clean with a very soft rag; otherwise as much acrid moisture may be left on it as may produce vesication and dangerous ulceration in the delicate skin of an infant.

In making a mustard and linseed poultice, the mustard should be first made into a smooth paste with tepid water, and then added to the mixture of crushed linseed and boiling water. By adding boiling water to previously mixed dry mustard and linseed the ferment—myrosin—is destroyed, and oil of mustard—the active principle—is not formed.

The mustard bath is a favourite method of applying counter-irritation—to the feet for *headache*; to the abdomen for

amenorrhœa, at the time of the expected period ; or to the loins in *suppression of urine*. About 2 ozs. mustard (previously mixed with a pint of *cold* water) to 10 gallons of hot water (102°) will make an agreeable bath. In a similar way it may be used as a *hot pack* in *rheumatism*, etc. (See under *Aqua*.)

Pain of various kinds is relieved by the application of a sinapism ; but, as a rule, it is aggravated if it be placed directly over the pained nerve. It should, as a general rule, be applied over the site of its origin near the spine.

Headache is often relieved by a sinapism applied over the nape of the neck, and *vomiting* is sometimes stopped when it is put over the epigastrium.

The action of mustard when placed over the seat of *internal inflammations*, or over the chest and legs in case of *stupor*, is to be explained on the theory of reflex action. (See under *Cantharis*.)

Sodium.—The salts of sodium possess such close resemblance in their pharmaceutical, chemical, and therapeutical properties to those of potassium, that only a brief enumeration of them is necessary. Speaking generally, sodium salts differ in the following respects from the corresponding potassium compounds—(1) they are less caustic when used externally ; (2) they *exert scarcely any depressing influence over the heart*, and hence are not poisonous in the sense that potassium salts are ; (3) they are less diuretic ; (4) they form less soluble salts with uric acid ; (5) owing to the entire system being saturated with sodium, medicinal doses do not appreciably affect metabolism (Mitchell Bruce) ; and (6) they are much less diffusible.

Soda Tartarata.—Rochelle salt closely resembles the tartrate of potassium, though its diuretic powers in $\frac{1}{2}$ to 1 oz. doses are so feeble that they are doubted by some. It is a very popular saline purgative, acting as a strong stimulant to the intestinal glands. Small doses have the power of rendering the urine alkaline like the potassium salts, though not so certainly.

Its cathartic action is most unreliable unless given in a full dose, so that it is a good rule to give at least 6 drs. Often 4 drs. may be administered and *no effect whatever* be noticed, while 5 or 6 drs. may purge freely. The B.P. *maximum* dose (240 grs.) is quite too small.

1 oz. Rochelle salt dissolved in a small tumblerful of aerated lemonade or ginger ale makes a pleasant saline purgative ; or it may be taken in the form of Seidlitz powder.

Sodæ Chlorinatæ Liquor.—This is a reliable disinfectant ; the hypochlorite of sodium contained in it is readily decomposed when it comes in contact with the weak acid compounds of the body.

The hypochlorous acid, which is given off in contact with any acid, is a powerful oxidising agent, giving off its active oxygen, which greedily attacks most animal substances, whilst its chlorine enters into combination with the hydrogen of many bodies. It thus becomes a strong deodorant and antiseptic, and has been recommended in low *typhoid conditions* and *adynamic fevers*, especially in *diphtheria* and *malignant scarlatina*, but it is seldom used internally. It should be given alone with water—1 scruple mixed with 1 oz. every two or four hours.

Externally, it is an invaluable remedy as a gargle in *putrid throat affections*, in which case it may be made of the same strength as for internal use. (See Calx Chlorinata.)

Sodii Arsenas. (See under Acid. Arsenios.)

Sodii Benzoas is identical in action with Acid. Benzoic. (which see). It is used for its diuretic and antiseptic qualities in *renal* and *bladder diseases*, being excreted as hippuric acid after uniting in the body with glycocoll. It has been given in *diphtheria*, *phthisis*, *rheumatic fever*, *uræmia*, and *gout*.

Sodii Bicarbonas closely resembles the bicarbonate of potassium (which see). Like it, it is antacid, and though less irritating, it possesses greater saturating power. It has also a more soothing effect upon the stomach than the corresponding potassium salt, but it is very inferior to it as an antilithic, since the salts which it forms with uric acid are only slightly soluble. This is seen in *gout* in the deposit which forms about the joints, which consists of urate of sodium. It does harm in cases where there are phosphatic sediments in the urine. To neutralise *gastric hyperacidity*, the drug may be used in 30 to 60 gr. doses with great benefit, and even for long periods.

In the form of Vichy water the bicarbonate of sodium has been long in use as a remedy for many complaints supposed to be of *gouty* origin, and has been found to relieve *frontal headache*.

Externally, the bicarbonate of sodium has been found to possess an almost magical power when applied to painful *burns* and *scalds*. If used *immediately* after contact with great heat, what would otherwise be a painfully blistered spot is entirely relieved, and often in a few hours may be found to differ in no way from the healthy surrounding skin. It may be applied in solution of any strength, and the salt made into a paste with water and rapidly applied to the injured part prevents the usual vesication. It should not be applied if vesication has already occurred.

It is useful in *acute tonsillitis* as a gargle, or brushed over the swollen glands.

It is used in a variety of *cutaneous affections*, and 1 oz. in a pint of water, sponged over the itching skin in *urticaria* and other complaints, often gives relief; it may be combined in these cases with Prussic acid. It relieves the pain of *wasp stings*, but is inferior to ammonia in this respect.

Sodii Bromidum acts like the bromide of potassium—(page 339)—only it is less irritating to the stomach and less depressing upon the heart, and should always be preferred in *epilepsy*.

Sodii Carbonas resembles the bicarbonate, but is more caustic and more soluble. It makes a very good effervescing mixture when given with lemon juice—superior, indeed, in its sedative effect upon the stomach to any other combination, and with it hydrocyanic acid can be given.

R. *Sodii Carbonatis* ʒvj.
Acidi Hydrocyanici Dil. m. xxx.
Aquæ Destillatæ ʒx. *Misce.*

Fiat mistura, cujus cpt. ʒi. cum ʒss. succi limonis recentis tertiis horis.

The alkaline bath is made by dissolving 8 ozs. of carbonate of sodium in a large bathful of water—say about 60 gallons.

Sodii Chloridum enters so largely into every tissue of the body that life cannot be sustained when it is withheld, being absolutely necessary wherever cell growth is rapidly going on. This explains the craving for salt which is witnessed in the case of herbivorous animals. The large amounts of potassium salts contained in their food combine in the blood with the sodium salts, which are therefore excreted along with the potassium compounds. The result is a demand for sodium chloride. This also explains, according to Bunge, the well-known craving for chloride of sodium observed in men who live entirely upon a vegetable diet. Small doses are restorative and tonic; large doses (1 to 2 ozs.) are either slightly purgative or emetic.

It possesses expectorant qualities if given in 1 dr. doses—every two or four hours. It is excreted by the mucous membranes of the body. In strong solutions it is a certain antiseptic, and destroys the small thread-worm, *ascaris vermicularis*, when administered by the rectum ($\frac{1}{2}$ oz. in 3 or 4 ozs. of water).

1 lb. of salt and 3 gallons of water make a convenient substitute for sea-water. The brine baths of Droitwich and Nantwich owe their virtues chiefly to this soda salt; they are of great value in *chronic rheumatism and joint diseases*.

It is used sometimes (1 to 30) as a gargle in *chronic catarrhal throat affections*, and is a valuable antidote in cases of *poisoning with nitrate of silver*, or after swallowing a *leech*. Wyman

applies the dried salt mixed with three times as much elm bark and a little hyoscyamus to the os uteri in *subinvolution*, and retains it *in situ* with cotton-wool. It depletes like glycerin.

Betz has used chloride of sodium in *internal hæmorrhages* with marked benefit. He dissolves a teaspoonful in $\frac{1}{2}$ litre of water, and administers it by the mouth at the rate of 3 tablespoonfuls every five minutes. Since Nothnagel pointed out the good results of common salt in *epilepsy* various observers have reported cures. 1 dr. doses may be given. In a similar way *migraine* is sometimes relieved.

The *hypodermic* injection of normal solution of salt (80 grs. to 1 pint sterilised water) into the subcutaneous cellular tissue has been advised in *cholera*, and in doses of 5 to 40 ozs. it has often saved life in *uræmia*, *hæmorrhages*, *diabetic coma*, *eclampsia*, *shock* after abdominal or pelvic operations, etc. The writer has injected by the aspirator needle 1 oz. of salt, dissolved in 6 pints sterilised water, selecting the thighs, abdomen, buttocks, and back, in many instances, without the least untoward results. It may be injected into the veins in urgent cases, where it gives better results than transfusion of blood. Sometimes the peritoneal cavity is selected. The liquid should have a temperature of 104° or 105° F. Trunczek's Serum consists of sodium chloride 492, sodium phosphate 15, sodium sulphate 44, sodium carbonate 21, potassium sulphate 40, and water to 10,000.

Sodii Citro-Tartras Effervescens.—This agreeable antacid and purgative is the official representative of the popular "Granular Citrate of Magnesia," only the latter usually contains some Epsom salt. It may be taken in tablespoonful doses, dissolved in a large quantity of water.

Sodii Ethylatis Liquor is a valuable caustic, powerful and almost painless; it is antiseptic. Brushed over *lupoid growths* and small *navi*, it causes their obliteration with very little deformity. It should be applied with a glass brush or camel's hair pencil occasionally, till a scab forms, and then its application should be withheld for a few days till the scab or destroyed cuticle falls off, when it may be reapplied. If pain results, a drop of chloroform, which converts the ethylate into ether and chloride of sodium, may be laid upon the part.

Sodii Hypophosphis resembles in its action the lime salt of the same name. It has been erroneously supposed to give all the benefits of free phosphorus without any of its drawbacks, and the evidence of its usefulness in *scrofula* and *phthisis* is regarded by several authorities as somewhat doubtful.

Sodii Iodidum resembles closely the iodide of potassium, and can be tolerated by the stomach in larger doses, and could be substituted for it on all occasions with benefit.

Sodii Nitris has been found to possess properties similar to nitroglycerin and nitrite of amyl ; thus, within 10 to 15 minutes after a dose of 5 grs. there follow flushing of the face, throbbing of the head, increased frequency of the pulse, lowering of the arterial pressure, etc. Hay has closely studied its chemical action alongside nitrite of amyl and trinitrin, and believes that they all owe their activity to the nitrous acid contained in them.

There appears to be a decided advantage in favour of nitrite of sodium over the amyl salt in the duration of its influence, but it has the corresponding disadvantage of being slower in giving relief unless taken *before* the attack of *angina*. It is used with good results in the increased arterial tension of *granular kidney disease*, especially when associated with a weakened and dilated heart, and in some cases of *aortic disease*.

It does not cause so much throbbing and headache as nitroglycerin. Lublinski has employed it in *hemisrania* and in *asthmatic complaints* of purely bronchial and neurotic origin with marked success.

Sodii Phosphas is a saline purgative, and can be safely used when most purgatives are contra-indicated—in serious cases of *enteric fever* with bowel complication. It can, owing to its freedom from unpleasant taste, be given instead of common salt in beef tea or soup. This is a most satisfactory plan of giving a mild cathartic in *fevers* ; $\frac{1}{2}$ oz. often will be found enough, but three times this quantity may be administered ; the effervescing preparation may be tried. It is also recommended in small doses for the qualities which it possesses in common with all the sodium and potassium salts—antacid, diuretic, antilithic, etc.

Sodii Salicylas. (See under Acid. Salicylic., page 310.)

Sodii Sulphas.—Glauber's salt is largely used in veterinary practice, and by its stimulating effect upon the glandular intestinal apparatus, it is a safe and certain purgative for man. The experiments of Rutherford also prove that it is a moderately powerful stimulant to the liver, and it has been given in 1 dr. doses in *biliary calculi*. (See under *Magnesii Sulphas*.) The effervescing preparation is a great improvement. Reverdin affirms that sodium sulphate in 2 gr. doses every hour increases the coagulability of the blood in hæmorrhages, but it is of little value in this respect compared with lime salts.

Sodium sulphate is the chief constituent of several of the natural mineral waters, as in Carlsbad Sprudel water, which, however, usually does not purge, the spring only containing about a scruple of this salt in every pint. Marienbad is about twice as strong. It is found in one of the strongest of all the

natural bitter mineral purgative waters—Rubinat—which contains 840 grs. to the pint, combined with about 28 grs. magnesium sulphate. Æsculap contains about 120 grs. sodium sulphate and 150 grs. magnesium sulphate in each pint. Hunyadi-Janos contains about 150 grs. of each of these salts per pint, according to Squire.

Sodii Sulphis is a weak antiseptic, preventing fermentation, like sulphurous acid. It is given in 20 gr. doses in various *stomach* affections characterised by the presence of *sarcinæ* and *torulæ*, and, in solution, has been used externally in *chloasma*, *tinea*, and various parasitic skin diseases. The hyposulphite in drachm doses has been found valuable in gangrene of the lung.

Sodii Sulphocarbolas possesses the antiseptic and antipyretic qualities of carbolic acid. It has been given in *fermentative states of the stomach*, *cholera*, *diphtheria*, *scarlatina*, and all the *fevers*, and in various *septic* conditions, as in *ulcerative endocarditis*, where Sansom praised it strongly.

Spiritus Rectificatus and Vini Gallici. (See under Alcohol, page 315.)

Staphisagriæ Semina contain four alkaloids, Staphisagrine and Delphinine being the most important. The former is a powerful poison like curara. Delphinine acts like aconitine, and when applied over painful cutaneous nerves causes numbness and tingling, and diminishes pain like veratrine. It has been used as an ointment (20 grs. to 1 oz.) in *neuralgia*. Internally it slows the pulse like aconite, and diminishes the number of respirations, causing death by asphyxia with spinal paralysis. It has been given in *asthma*, *rheumatism*, *neuralgia*, and *dropsies*, in doses of $\frac{1}{4}$ gr.

Stavesacre seeds are, however, introduced into the B.P. on account of the satisfactory power which their ointment possesses over the parasite that frequents the hair of the head. The official ointment destroys pediculi with safety. Formerly the seeds were given internally as an emetic and vermifuge, but their use is now restricted to their antiparasitic action.

Stramonium possesses properties identical with belladonna, and yields hyoscyamine and atropine. The leaves of the plant have been long used as a remedy when smoked alone or mixed with tobacco for *spasmodic* bronchial affections, chiefly *asthma*. Sawyer recommends the inhalation of the fumes produced by burning a powder consisting of 1 oz. of the powdered leaves, $\frac{1}{2}$ oz. powdered anise fruit, and $\frac{1}{2}$ oz. nitre. This somewhat resembles, in composition, Ellis's, Himrod's, and Girdwood's *asthma* cures. The extract made from the seeds, in doses of $\frac{1}{2}$ to 1 gr., sometimes prevents the asthmatic attacks when given a few hours before the expected seizure.

Stramonium belongs to a natural group, called from their action, by Headland—Delirians. The group contains *Belladonna*, *Hyoscyamus*, *Stramonium*, *Datura Fastuosa*, and *Datura Tatula*.

Strophanthus is a powerful cardiac tonic. It is a muscle poison, stimulating and afterwards depressing all striated muscle, and finally arresting the heart in systole, as first worked out by Fraser. It very closely resembles *digitalis*, though it is more toxic, and its effects upon the circulation are produced mainly by its action upon the heart, as it has only slight influence in causing contraction of the arterioles. It can therefore be given more safely when the general blood pressure is already high.

It is diuretic, but not to the same extent as *digitalis*, and it is also said to be antipyretic. In every form of cardiac weakness, either arising from functional excitement, valvular disease, degenerative changes, or secondary to renal affections, this remedy has established for itself a reputation only second to *digitalis*, and in some respects it has the advantage of that drug, as it can be given in those cases which one meets with where *digitalis* cannot be tolerated, and the writer has noticed that this oftener occurs in mitral obstruction, with a very narrow orifice. It only slightly accumulates in the system, and it produces less digestive disturbance, and if its effects pass off more quickly they are certainly more rapid in their appearance, and it can be easily given hypodermically. Moreover, *strophanthus* is invaluable as a remedy to be given in the intervals, when it is found wise to suspend *digitalis*, and in those cases where the latter drug causes trouble by its effects upon the capillaries. It will be found a wise and often highly satisfactory plan to give *digitalis* for two months, and then *strophanthus*, combined with Easton's syrup, for one month, in ordinary cases of failing compensation. (See under *Ouabain* in the Non-Official Remedies.) The writer has obtained good results from the drug in *exophthalmic goitre*. The B.P. tincture is made so weak that it has the same dose as the tincture of *digitalis*, but it should be certainly regarded as much more highly toxic than equal doses of the *digitalis* tincture. It is not a safe plan to give both drugs at the same time.

Strychnina. (See *Nux Vomica*.)

Styrax Præparatus.—This balsam resembles those of Peru and Tolu in its action, being a feeble, stimulating expectorant and antiseptic. It possesses some tonic influence over the genito-urinary mucous membrane, and has been used in *gonorrhœa*. 20 grs. may be given, made into a bolus with liquorice.

Mixed with twice its bulk of olive oil it is efficacious in *scabies*, but albuminuria has been noticed after its application.

Sulphonal is the type of a pure hypnotic, and possesses no analgesic properties. In small doses it relieves the night *sweats of phthisis*.

In cases of simple *insomnia* uncomplicated with pain it acts with much certainty, and is free from the objectionable qualities possessed by chloral. Thus experience has proved that a sulphonal habit has been very rarely observed, and though it appears to have *slight* and insignificant cumulative action, there is little necessity for increasing the dose. Sleep does not come on immediately, sulphonal being very slow in its action, and sometimes three or four hours elapse before the soporific effect begins to manifest itself. Leech drew attention to the prolonged deferred action of sulphonal, which sometimes causes a drowsiness, which may last for a considerable part of the day following its administration. This is liable to happen when it has failed to induce sound refreshing sleep after the usual interval. This drowsiness often extends into the following night, and some patients find that it produces better effects upon the second night without taking any more of the drug in the meantime. Hence the writer only gives sulphonal in full doses every alternate night in simple *insomnia*. Savage, in cases of *insomnia* following prolonged mental strain in barristers, recommends the drug to be given where the patient can remain 48 hours in bed. There is no depressant cardiac action, and the respiration and arterioles are not influenced. The only untoward effects are those which occasionally have been observed in the nervous system. Restlessness, hallucinations, vertigo, giddiness, and confusion of thought have sometimes, though rarely, been noticed to take the place of sleep, or to remain on awaking.

Ataxia and muscular weakness, with staggering gait, occasionally follow the use of the drug, and after full doses the incoordination has appeared to resemble drunkenness. Hæmatoporphyrin and albumin may appear in the urine.

30 grs. should be given from 1 to 3 hours before retiring to rest. If a moderate dose of very hot whisky punch be selected as the vehicle, the most unobjectionable and certain hypnotic combination will be obtained. When the alcohol is combined with it, the dose should be given as the patient retires to bed, as when given in solution its effects are rapid.

The writer generally gives it in fine powder, made up as a sandwich between two pieces of thin bread and butter, or dropped dry upon the tongue and washed down by a draught of water.

It may be given in the sleeplessness of every disease where pain is absent, and it is one of the best remedies for *simple insomnia*. In *insanity*, however, it is inferior to paraldehyde and hyoscine, in the opinion of those best calculated to judge, and in all depressed states of the mind its action is less certain. It is the best soporific for children.

Sulphur, coming into contact with living protoplasm, gives off H_2S and sulphurous anhydride; hence, even when externally applied, it acts as an irritant and antiparasitic agent. When administered in a full dose (say 2 drs.) it passes unaltered through the stomach, and meeting the alkaline pancreatic secretion and bile, a small quantity is absorbed after its solution in these fluids as alkaline sulphides and sulphuretted hydrogen. This, after circulating through the blood, is excreted by the skin in the form of sulphuretted hydrogen, staining any metallic substances with which it comes in contact. Some of it is also excreted by the kidneys as sulphates, and some passes off by the respiratory mucous membrane, which it stimulates. Of the surplus in the intestine a further small quantity is converted into sulphides as it passes onwards towards the anus, and acts as a mild irritant (just as sulphide of calcium would do, if administered); this causes slight purgation, producing large, softened motions. The residue, which constitutes the greater part of the dose, acts by the angularity of its gritty particles the part of an irritant, like bran, etc., and increases slightly the peristaltic movement of the bowel, and thus aids purgation, but the impalpable precipitated drug also increases peristalsis.

Since it exists in large quantities in the bile, sulphur will act as a restorative in some conditions of the system characterised by a deficiency of that fluid; moreover it has marked antiseptic action. Buckheim found that when sublimed sulphur was administered 15 per cent. of it appeared in the urine as sulphuric acid, but when the milk of sulphur was taken 46 per cent. appeared.

Its purgative action renders it very useful in the treatment of *hæmorrhoids*, and Neligan believed that in addition to its effect as a mild cathartic in this complaint, it exercises a beneficial soothing influence over the *hæmorrhoidal* vessels, whereby their calibre is diminished and the symptoms ameliorated.

It has been used as a purgative in *skin diseases* like acne, but it often aggravates if there be active cutaneous inflammation, and it is liable to cause boils and eruptions.

Sulphur is an expectorant, the H_2S stimulating as it passes out the mucous epithelial cells of the respiratory passages, with their cilia, and it often gives good results in *chronic bronchitis*.

Sulphur is best administered in marmalade thus:—Sulph. Præcip. ʒiiss.; Conservæ Aurantii (Keiller) ʒviii. The lozenges are a convenient and agreeable method of administering the drug in *chronic constipation* with anal troubles.

All the virtues of sulphur are found in a vegetable containing it, in considerable quantity (the onion), and it will be found for every purpose the most satisfactory form for the

administration of the drug. The Spanish onion, boiled for one or two hours, and eaten freely at bed-time, is a certain purgative, and possesses most decided expectorant qualities. In cases of *chronic catarrh* of the larger *respiratory tubes*, it is more efficacious than any official expectorant, probably because it contains a volatile principle in addition to the sulphur.

Sulphur has been praised as an external and internal remedy in *chronic rheumatism*, and forms a principal ingredient in the "Chelsea Pensioner." (Page 390.) Valuable results are obtained in *sciatica* by bandaging the entire limb in flannel after being freely rubbed and sprinkled over with a thick layer of sulphur. In these cases the drug rapidly finds its way into the system.

The sulphides have been highly commended in various *suppurative skin affections*—as *boils* and *acne*; the onion treatment has proved much more satisfactory in the writer's hands than sulphide of calcium, which is occasionally uncertain and often intolerable.

Externally, sulphur is the best treatment for *itch*; a thorough application of the official ointment to the skin, after a hot bath and good scrubbing with soap to break up the burrows of the insect, generally proves efficacious. The pentasulphide of calcium, prepared by boiling 4 ozs. of powdered sulphur with an equal quantity of lime-putty, or slaked lime, in 40 ozs. of water, is a more certain and elegant application, known as Vlemingkx's Solution. It should be lightly brushed or sponged over the affected part. It appears to act by instantly giving off sulphuretted hydrogen on coming in contact with organic matter, this gas destroying the insect. It is free from the objectionable greasiness of the ointment, and is less irritating, if the skin be unbroken.

Sulphur is a popular local application to the false membrane in *diphtheria*, either as a gargle or insufflation; as it comes in contact with the mucous membrane H_2S is freely given off.

The treatment of phthisis by rectal injections of sulphuretted hydrogen has passed into disuse. The gas is a powerful poison, causing asphyxia by its reducing action on the oxy-hæmoglobin.

The ointment is recommended in *seborrhœa* and *acne*, and often does good when well rubbed into the indurated spots. The precipitated sulphur in a lotion is an unobjectionable way to use this remedy for *acne*, but the drug generally increases eczematous conditions unless of a very chronic type.

R. *Sulphur. Præcipitat.* ʒij.

Glycerini ʒj.

Aquam Rosæ ad ʒviiij. *Misce.*

Fiat lotio. Applic. mane nocteque.

Potassa Sulphurata acts like sulphur when given in very small doses ; in large doses it is an irritant poison, and produces narcotic symptoms and convulsions. It is recommended in 2 gr. doses in various chronic *skin* diseases. (See Calx Sulphurata.) Externally, it is used as a bath (5 ozs. to a large bath of warm water) in *scabies*.

Sulphuris Iodidum.—This remedy is a powerful antiparasitic agent, possessing the properties of the two substances entering into its name. It is only used externally as a remedy in *parasitic diseases* and occasionally in *acne* and *scrofulous affections*. From experience of the writer in an agricultural district where *herpes circinatus* was exceedingly common (being transmitted to the human species from the cow), this remedy was found more certain than any other, scarcely ever failing to entirely remove all traces of the parasite when applied a few times to the diseased spots. It is, however, liable to produce irritation of the skin. The official ointment requires laborious trituration, otherwise the hard, gritty iodide is left in little masses, which produce local inflammation of the skin. It should not be used when freshly prepared.

Sumbul.—This root is supposed to possess nervine tonic properties closely resembling valerian and musk, and has been used as a substitute for this latter drug in low *typhoid* states and *fevers*, *asthma*, *delirium tremens*, *epilepsy*, and *hysteria*. It should be omitted from the B.P.

Tamarindus.—The pulp of the tamarind is seldom used alone ; it is a laxative in doses of 1 oz., increasing the peristaltic movements of the intestines. It is said to be refrigerant, and is occasionally used in fevers in the form of "tamarind whey," made by mixing an ounce of the pulp in a little boiling water, and adding the infusion to a quart of milk. Its refrigerant action is due to the vegetable acids, malic, citric, etc., which it contains.

Taraxaci Radix has long enjoyed the reputation of a tonic, cholagogue, diuretic, and laxative. As it is now obtained from the chemist, it has little therapeutic power. The tonic effects of the *fresh* juice, prepared by the patient immediately before use, or even of an infusion prepared just after the root is gathered, when the juice is bitter, are decidedly good, and it is a useful vehicle for more active tonics.

Terebene is a powerful antiseptic, disinfecting, and deodorising liquid, with an agreeable balsamic odour, and very complex chemical composition, acting like turpentine. It is used in *phthisis*, mixed with thymol and carbolic acid in equal proportions as an inhalation ($\frac{1}{2}$ dr. to 1 pint of hot water), or sprinkled over wool in an antiseptic respirator.

Internally, it has been given with success in *chronic bronchitis* and *winter-cough* by Murrell as a stimulating expectorant, and the writer has often seen its benefits in these troublesome complaints, especially when *emphysema* is present. It acts like eucalyptus when used as a spray, and is said to exert its good influence over the urinary and gastro-intestinal mucous membranes; and Betrin reports that, applied freely on pledgets of lint, and kept in contact with uterine epitheliomata, splendid results are obtainable.

10 to 15 mins., in thick syrup or in capsules, may be given three times daily.

The cheap disinfectant liquor sold under this name is a valuable deodoriser for the sick room.

Terebinthina Canadensis, though possessing the properties of the oil of turpentine, is only used for its physical qualities. It is largely employed in the preparation of microscopic objects, and has been occasionally given (made into a pill, with carbonate of magnesium), for *gleet* and *chronic gonorrhœa*.

Terebinthinæ Oleum acts as a counter-irritant when applied to the skin. The ordinary turpentine stupe is made by sprinkling the oil over flannel cloths wrung out of very hot water, and applying them quickly to the part. In this way rapid vesication can be produced. It is powerfully antiseptic, and hæmostatic when applied to *fresh wounds*, and it is useful in *parasitic skin diseases* and *sloughing sores*.

Internally, a small dose acts as a carminative, and after absorption produces contraction of the capillaries, and the vapour causes the minute pulmonary vessels to contract after inhalation, and the secretion is checked.

In large doses turpentine acts as a general stimulant, increasing the cardiac force and raising the blood pressure, and, if it does not purge or pass off by the bowels, it causes inebriation like alcohol, and in very large doses it depresses the functions of brain, medulla, and cord, dilating the vessels, and lowering blood pressure and depressing the respiratory centre. After circulating in the blood, it is eliminated by the skin, respiratory mucous membrane, and kidneys, acting as a diaphoretic, expectorant, and diuretic; and is useful in *bronchitis* and *hepatic dropsy*. It is apt to cause strangury and bloody urine, and should be used cautiously where the kidneys are diseased. Turpentine also possesses very decided anthelmintic properties, but must be given in large doses ($\frac{1}{2}$ oz.), and its combination with castor oil renders it much less liable to cause strangury than if given alone. The *tape-worm* is dead on its expulsion after the use of this remedy.

The vapour of turpentine is a valuable hæmostatic in *hæmoptysis*, if the air of the patient's room be saturated with it. Full doses are valuable in *internal hæmorrhages* by causing

contraction of the arterioles and increased coagulability of the blood, and 20 mins. every hour may save life in hæmorrhages from the bowel in *typhoid fever* and *dysentery*. For the hæmorrhage of gastric ulcer it is objectionable owing to its liability to increase vomiting.

As an enema it is a valuable remedy in *tympanitic distension of the abdomen*; it excites such uniform contraction as expels all accumulations of imprisoned gas in the bowels. Turpentine has a prophylactic and curative action in cases of *gall-stone*, and it may cause the solution of small calculi in the gall-bladder. It has been recommended internally on account of its astringent action on the cutaneous capillaries in *psoriasis*, *eczema*, *pityriasis*, etc., and in *iritis*, in *bladder diseases*, and in the *hæmorrhages of purpura*, in which latter it is invaluable. It formerly enjoyed a reputation in *typhoid* and *typhus* fevers as a stimulant in adynamic cases. Turpentine may be best given in capsules.

Oil of turpentine, especially the French oil, which has been kept some time is rich in ozone, and is considered to be a valuable antidote to the poison of phosphorus.

Theobromatis Oleum is only used as a basis for suppositories.

Thus Americanum is not used internally. It is added to plasters on account of its mild stimulating influence on the skin, and also on account of its toughness and adhesiveness.

Thymol acts as a powerful antiseptic, and when applied to the skin causes some degree of local anæsthesia like carbolic acid. Strong solutions cause irritation, sometimes ending in severe inflammation of skin and mucous membranes.

1 gr. dissolved in 2 ozs. water makes a solution which instantly puts a stop to putrefactive or fermentative changes in any fluid to which it may be added. It is thus a more potent antiseptic than carbolic or salicylic acid; an ointment (1 to 8 of vaseline) has been used by Squire as a remedy in *parasitic skin diseases*. A solution of 1 part of thymol in 18 of petroleum or 15 of ether is a valuable remedy in ringworm of the scalp or beard; it penetrates into the hair follicles.

The following formula is used at the London Throat Hospital in *laryngitis* and *bronchial affections*:—Thymol, 20 grs.; spirit, 3 drs.; carbonate of magnesium, 10 grs.; water to 3 ozs. A teaspoonful to a pint of water at 150° for each inhalation.

Burns washed with a watery solution ($\frac{1}{2}$ gr. to 1 oz.), and then brushed with an oleaginous solution ($\frac{1}{2}$ gr. to 1 dr.), heal rapidly.

A solution in water (1 in 1,000) is used as an injection in *leucorrhœa*, and as a lotion to *wounds*, *chronic eczema*, *ozæna*, *psoriasis*, and *ulcerated throat*. Thymol gauze and lint are used as antiseptic surgical dressings, and a 1 per cent. solution is

used *warm* to swill out the abdomen after operation for perforative peritonitis.

Internally, thymol has an action like carbolic acid, and also produces symptoms like those seen in turpentine poisoning. The centres in the medulla and cord are paralysed, the temperature, respiration, and blood pressure falling markedly before death. It is eliminated by the bronchial and renal surfaces. According to Brunton, these surfaces are congested, and the lungs and kidneys are inflamed in animals poisoned by thymol. The urine is often coloured green after moderate doses of the drug. It has been given in *typhoid fever*, *pleurisy*, and *pneumonia*, in doses of 25 to 45 grs.; it caused persistent diminution of temperature, and no ill effects. Good results have followed its administration in *chronic cystitis* with profuse discharge, and it has been recommended in *diabetes* and *diphtheria*.

It is the only reliable method of destroying the *ankylostoma duodenale* when given in doses of 15 to 30 grs., repeated four times at intervals of two hours, followed by a purge, care being taken that no solvent of the drug be administered afterwards. Bozzolo urges the administration of thymol in *cholera*. The B.P. dose is $\frac{1}{2}$ to 2 grs.

It should never be given in solution, as it causes a burning sensation in the throat and mouth.

Volkmann's Antiseptic Liquid consists of thymol 1, alcohol 10, glycerin 20, and water 1,000 parts.

Thyroideum Siccum and Liquor act as a true restorative when the thyroid function is in abeyance. After the recognition of *myxædema* came the discovery that it was due to absence or disease of the thyroid gland. Thyroid grafting, injections of the gland substance, and finally the administration by the mouth of glycerin extracts, and other preparations made from the glands of sheep, were tried and proved to be entirely successful in the removal of the disease.

In a short time after a daily dose corresponding to $\frac{1}{12}$ to $\frac{1}{8}$ of a sheep's thyroid, amelioration of all the symptoms and signs sets in, the subnormal temperature rises, and metabolism increases (for the appetite improves and the body-weight falls), the facial expression changes, and the mental symptoms pass off, and the patient so improves as hardly to be recognised by his friends. The writer has often seen in myxædematous patients a luxuriant growth of hair cover a scalp which had been like polished ivory.

The only danger liable to arise is in pushing the remedy too eagerly, as syncope may occur, and when full doses are administered the patient should be kept in bed. Marked acceleration of the pulse, emaciation, febrile temperature, and gastro-intestinal disturbance are proofs that the drug must be suspended, or given in smaller doses or at longer intervals.

5 mins. of the liquor in one daily dose by the mouth may be safely given at first, and increased to 10 mins. if improvement does not show itself in 10 or 14 days. 1 min. represents one-hundredth part of a sheep's thyroid. 5 grs. of the dry thyroid in pill, capsule, or tabloid is a fair dose. After the obvious symptoms have passed away, half the above maximum doses every second or third day will be found enough to keep up the improvement. Murray calculates that 60 mins. per week of the liquor represents the output of the thyroid gland in healthy individuals, and that this amount may be administered for indefinite periods without harm.

The next brilliant discovery in this domain demonstrated that *cretinism* (dwarf growth associated with idiocy) was caused by the congenital absence of the thyroid gland, and results were soon obtained which appeared incredible. 1 to 3 mins. of the liquor may be given in such cases daily; as symptoms indicate, the dose can be increased or diminished; ordinary *idiocy* and *imbecility* and various forms of *insanity* have yielded to its administration. The drug has been vaunted in exophthalmic goitre, but the writer has tried it in a series of cases, and has never seen anything but harm follow, and in two cases grave injury to the patient resulted, and he believed death was hastened in one of these after a few small doses. The drug has been successfully used in the treatment of *obesity*, but its administration requires care. Various skin diseases, as *psoriasis*, *pityriasis rubra*, *ichthyosis*, *eczema*, *lupus*, etc., have been benefited by it. Cheron uses it in threatened abortion with hæmorrhage, and as a galactagogue. Serafine extols the thyroid treatment in *simple goitres*, especially in the form known as struma parenchymatosa, and many observers have reported diminution in volume, and in many cases complete cure, after the use of the drug. It acts best in recent goitres, and has little effect in old-standing fibrous ones. Gauthier has successfully administered thyroid in cases of ununited fracture. Telford Smith has drawn attention to the tendency of the bones to bend in cretins under thyroid treatment, as in cases of rickets. The drug has been recommended for hypodermic injection in *puerperal eclampsia* upon the theory that this condition depends upon defective action of the thyroid.

Better results are obtainable in all cases by using the dried gland or the liquor than by administering iodothylin, thyrocolloid, or other so-called active principles.

Tragacantha.—This gum is only employed to aid the suspension of heavy metallic powders in mixtures, it swells upon the addition of water into a thick mass or mucilage, which readily diffuses through any quantity of water. (See pages 25 and 26 for Glucanth and Proctor's Paste.)

Trinitrin or Nitroglycerin is a powerful vasodilator, acting like nitrite of amyl, but its effects are more prolonged. One or two of the tablets cause in about 3 minutes throbbing and fulness of the head, soon spreading over the entire body; the increase in the pulse-rate, and of the flushing of the face, is considerably less than that resulting from amyl. The blood pressure falls, the temperature is but slightly depressed in ordinary doses, but giddiness and severe frontal headache often last for a considerable time. If the dose be increased the pulse and respiration are greatly quickened, paralysis of the motor and sensory centres of the cord occurs, the heart becomes very much weakened, and the respiration slower, and finally paralysis of the respiratory centre supervenes, and the blood assumes a dark chocolate colour, as in poisoning with nitrite of amyl and nitrites of sodium and potassium. Enormous quantities of the drug can be taken without causing serious harm to the human organism, and when it fails in relieving *angina* it is often owing to the dose being too small.

Hay believes that the activity of nitroglycerin is due to the nitrous acid which is formed by its decomposition within the body. He shows that the astonishing activity of so small a dose as $\frac{1}{100}$ gr. is owing to its being absorbed unaltered by the stomach, which decomposes to a great extent the ordinary nitrites, and the *nascent* nitrous acid formed by its final decomposition in the blood and tissues exerts a more incisive action than the nitrous acid of a nitrite. (Nitroglycerin is a *trinitrate* of glyceryl.)

Excellent results follow the administration of trinitrin in *angina*, where its action, though not so prompt, is much more lasting than that of amyl. One tablet is given every 3 or 4 hours, and the dose gradually increased till 3, 4, or 6 be taken during the threatening of an attack.

☞ The writer believes that the method by which he employs this drug in *angina* will give better results than any other treatment of this serious malady. He directs the patient to break up each tablet into 6 or more portions, one of which he takes every 15 or 20 minutes during the day. There is really no difficulty in administering the drug so frequently, and patients readily adhere to the plan which saves them headache and malaise, and generally they appear unconscious of any action of the remedy when so administered, save that the attacks are prevented. The writer has never failed with the drug when so employed. The plan is based upon a study of its physiological action. In cases of threatening attack, of course, a large dose should be given, and the effects kept up by small ones.

It has been successfully used in most forms of *cardiac dyspnœa*, *epilepsy*, *Bright's disease*, *neuralgia*, *tinnitus*, *puer-*

peral eclampsia, asthma, migraine, etc. It has been given with elaterin in *myxædema*, and to cut short attacks of *renal* and *hepatic colic*, and *ague*. It may be given in 1 to 3 or 5 min. doses of the 1 per cent. solution. Small doses prevent *sun-stroke*.

Nitroglycerin will often prevent *sea-sickness*, and the writer has noticed a peculiar effect which it sometimes produces if the treatment be commenced *after* sickness has already occurred—*i.e.*, the patient may continue to vomit, but all feeling of depression and nausea disappear, and the physiological action of the drug does not take place.

Uva Ursi is a diuretic and antiseptic to the urinary tract ; it also acts as an astringent and tonic, owing to its contained tannin. It contains arbutin, which, after absorption, is split up into hydrochinon in the blood, and, as the sulphate of this body, it passes out in the urine, which it darkens and renders aseptic ; it is recommended in *pyelitis* and *chronic inflammatory conditions of the bladder* where there is much discharge. It has been used in *menorrhagia, dysentery, and gleet*. (See under Arbutin, in the Non-Official Remedies.)

Valerianæ Rhizoma acts as a tonic and stimulant to the nervous system, and is especially useful in *hysteria*. It contains a volatile oil, which paralyses the cerebral nerve centres and cord, and reduces the blood pressure and slows the pulse (Brunton). Large doses of the infusion of the rhizome increase the rapidity and force of the ventricular contractions, cause an increase in the cutaneous secretion, and produce hiccough, nausea, vertigo, and slight mental disturbance. The good it effects in disease appears to the writer *to be owing to its diminishing the irritability of the terminations of the sensory nerves throughout the body*. This probable explanation of the action of valerian mentioned in a former edition of this work is supported by the results of Martel's observations ; he found that a strong decoction possessed marked *local sedative* influence when applied to *painful wounds*. He states that the inhabitants of Normandy use a lotion made from the root to relieve the pains of fractures and wounds. Binz found that a previous injection of the oil always prevented the convulsions which are produced by brucine and ammoniæ carb. owing to its sedative action upon the spasm centres.

It has been used with doubtful success in *diabetes insipidus, chorea, epilepsy, whooping-cough, laryngismus*, etc.

The salt of zinc with valerianic acid, in addition to its questionable antihysterical properties, is a weak antiperiodic ; and, combined with quinine and opium, is a valuable remedy in the treatment of *neuralgia*, especially if there be a tendency to show signs of periodicity, and it has been recommended in *diabetes*.

Veratrina, the alkaloid of cevadilla, is a violent irritant poison, producing vomiting and purging, with intense abdominal pain, convulsions, extreme muscular prostration, and great cardiac weakness and collapse, with a pricking sensation felt in the skin of the body. It exerts its action chiefly upon the *muscles* by producing *prolonged contraction*, which Brunton found could be removed by extremes of heat and cold. The sensory and motor nerve endings, at first stimulated, become paralysed, and the heart muscle, after slow and prolonged contraction, is arrested in systole, the pulse and blood pressure, having at first become increased, then fall markedly. The respirations, at first quickened by small doses, become slowed by large ones, and finally paralysis of the vagus and respiratory centre takes place. It is only used externally.

Veratrine, applied to the skin, paralyses the filaments of the sensory nerves, acting as a local anæsthetic, and hence has been used as an application in the form of the official ointment to various *neuralgic nerves*. The best results have followed its use in the case of the fifth nerve, and it has been found useful in *severe sciatica* and *sick headache*, when rubbed over the affected or tender nerves. Its use is generally followed by some local irritation in the skin. When it comes in contact with the nasal membrane it acts as a violent sternutatory and errhine.

Vinum Aurantii and Vinum Xericum are introduced into the Pharmacopœia for their solvent properties; the former to make quinine and citrate of iron wines, and the latter to form the menstruum for the remaining wines.

Zincum and its salts.—When used externally these substances are astringent and corrosive.

The astringent quality probably depends upon their forming insoluble albumin compounds, causing condensation of the tissue elements, at the same time producing contraction of the smaller vessels. The corrosive action depends upon their affinity for water, which they rapidly extract from the tissues, thereby causing their death. The effect varies in intensity from the powerful action of the chloride and iodide to the mild influence of the sulphate or oxide.

When administered internally, the zinc salts soon enter the blood, in which fluid they remain for a time, probably as albuminates, and are gradually and slowly eliminated in the fæces and slightly by the kidneys. After a long course of zinc medication, symptoms of chronic poisoning may show themselves, not unlike those seen in cases of lead poisoning.

Acetate of Zinc.—This salt is used as a local astringent, and with some skilful practitioners is their favourite remedy in *gonorrhœa* and other discharges. The following is a valuable

injection, and with six times as much Tr. Lavandulæ Co. constitutes the "Red Lotion" of Hospitals :—

R. *Zinci Acet.* gr. xxv.
Tr. Lavand. Co. ℥. xxv.
Aquæ Destillatæ ʒx. *Misce.*

Fiat injectio, secundis horis utenda.

Carbonate of Zinc and *Calamina* are used as mild, unirritating astringents or "drying applications" to *excoriations, intertrigo*, etc. They resemble the oxide in their action upon *eczema*.

Chloride of Zinc is still sometimes used as a powerful caustic by surgeons for the destruction of *lupoid, cancerous*, and other *growths*; death has often followed its use when carelessly applied. It is best applied mixed with about three parts of dry flour, and laid upon the diseased spot. Great care is necessary to prevent its spreading to the surrounding healthy parts; this is best accomplished by sprinkling them over with plaster of Paris. Jules Felix applies for 6 to 24 hours the following in fine powder made into a putty with water :— Dry chloride of zinc, 110; starch, 37; wheaten flour, 112; corrosive sublimate, 1; iodol, croton-chloral, bromide of camphor, and carbolic acid, of each, 10. This paste is painless, does not spread, and keeps indefinitely.

The astringent qualities of the chloride have rendered it a valuable remedy in *gonorrhœa*, injected in the proportion of 1 to 2 grs. to the ounce every two to four hours. It destroys the gonococcus upon whose presence the disease depends. It is a powerful antiseptic and deodorant. The liquor diluted with forty times its bulk of water arrests putrefaction and decomposes all gases with which it comes in contact. It may be used as a lotion to *putrid ulcers*, in the proportion of 3 mins. to each ounce of distilled water. Burnett's fluid is a concentrated impure solution.

Oxide of Zinc is chiefly used as a mild, soothing astringent in *eczema*. The zinc ointment is the best remedy for the troublesome *eczema of childhood and infancy*.

Internally, the oxide is found to enter the blood as lactate or chloride, and to exercise the functions of a mild astringent and sedative to the nervous system, and it has been extensively used in *epilepsy*.

In the *sweating of phthisis* the oxide has long enjoyed a high reputation, and may be used in the following form :—

R. *Zinci Oxidi* gr. v.
Ext. Belladonnæ Vir. gr. ss. *Misce.*

Fiat pil. mitte tales xvi. st. i. ter in die.

Sulphate of Zinc is the most popular of local astringents and is used in the following strengths in each oz. of injection :—

In *Gonorrhœa*, 2 grs. ; in *Leucorrhœa*, 3 grs. ; in *Otorrhœa*, 1 gr. ; in *Ophthalmia*, 1 gr.

The dried salt is used as a caustic to *uterine* and other *ulcers*.

Internally, the sulphate has been found useful in *chorea*, given in doses, beginning with 2 grs. for a child of 7 years, increased to 10 grs., 3 times a day. The stomach in a very short time becomes markedly tolerant of large doses. Its use has been advocated in *epilepsy* and other *convulsive ailments*, in *bronchorrhœa* and *diarrhœa*, but with varying success.

In doses of 30 grs., sulphate of zinc is the speediest and safest emetic, and is especially useful in cases of poisoning, being quicker in its action than ipecac., and much less liable to be followed by depression than tartar emetic. It acts by irritating the nerve endings in the stomach, and hence has been regarded as the type of local emetics. It is not a safe emetic for young children, but may be given in doses of $2\frac{1}{2}$ to 3 grs. to a child one year old, when an urgent action is required, and the dose may be repeated in 15 minutes. For a child 5 years old 10 grs. may be given, followed by copious warm-water draughts.

For the *Valerianate of Zinc* see Valerian. The action of this drug is probably entirely owing to the zinc contained in it.

Ointment of the *Oleate of Zinc* acts like the ointment of the oxide.

Sulphocarbolate of Zinc possesses the properties of the sulphocarbulates (page 475). It is sometimes used as an antiseptic lotion in *gonorrhœa* and *leucorrhœa*, 2 grs. to 1 oz.

Zingiber is a carminative and powerful aromatic stimulant, acting like capsicum and cardamoms ; chewed, it is a valuable sialagogue ; and used as snuff, it causes severe nasal irritation.

PART V.

NON-OFFICIAL REMEDIES.

OWING to the numerous synonyms by which many of these new drugs are known, the reader is advised, in looking up a non-official remedy, to turn to the general Index at the end of the volume.

(The letters B.P.C. stand for the British Pharmaceutical Codex.)

Abrastol is better known as **Asaprol**. It is calcium-beta-naphthol-alpha-monosulphonate, existing as a white powder very soluble in water. It resembles the salicylates and aspirin in its action, but possesses one advantage over the latter drug in its solubility, though it cannot be prescribed with quinine and most alkaloids, iodides, antipyrine, soluble sulphates, and alkalies. Riegler pointed out its value as a sensitive test for albumin; it precipitates albumose and peptone from acid solution, but these latter redissolve on heating, while the albumin remains unchanged.

The drug has been much used in acute rheumatism and influenza, reducing high temperatures speedily; it also possesses marked analgesic powers, and has given excellent results in sciatica and neuralgia. Its antiseptic action has been utilised both internally and externally: thus, in fermentation associated with painful dyspepsia, 10 to 20 grs. may be given thrice daily or every four hours, as in acute rheumatism, and a 3 per cent. solution has been successfully used as a spray in septic throat affections and pertussis, and as a lotion for wounds. As a lime salt, it is recommended like the chloride in remote internal hæmorrhages.

Absinthium.—The leaves and flowering tops of *Artemisia A.* (wormwood) have been used as a stomachic or bitter tonic in 1 dr. doses of the tincture (1 in 10). The French liqueur is the source of much drunkenness, producing, in addition to the ordinary effects of alcohol, a form of delirium tremens characterised by epileptic convulsions. Though the drug finds a place in nearly all the Continental pharmacopœias, it is wisely omitted from the B.P. The oil powerfully stimulates the cerebral cortex, and produces symptoms like camphor followed by epileptic convulsions and hallucinations.

Artemisin is an active principle discovered by Merck in *A. maritima*, and used as a bitter tonic, and in combination with quassin has been used in anorexia and with iron in chlorosis and anæmia in doses of $\frac{1}{30}$ gr.

Acetone is a colourless ethereal liquid, being dimethyl-ketone prepared by the distillation of various acetates. It is mainly used in the manufacture of chloroform and as a solvent for fats, resins, pyroxylin, and cantharidin. It has been recommended as an expectorant and antispasmodic in asthma, in 60 min. doses. Its power of abstracting water from the tissues renders it a valuable local application after curetting in cancer of the uterus. Iodoacetone (iodine 1, acetone 50) is used for the sterilisation of catgut. Acetone-chloroform, Chloretone, or Trichlor-butylic alcohol, is a solid crystalline substance not to be confounded with chloroform prepared from acetone. An oily solution (5 per cent.) is instilled in middle-ear diseases. Internally it is valuable as an hypnotic (15 to 20 grs.) in epilepsy, sea-sickness, and chorea (5 to 10 gr. doses); it has recently proved a valuable laryngeal analgesic when used as an insufflation in powder, and it relieves the pain of dental caries, and under the name of Dentalone, is dissolved in essential oils for this purpose.

Acetopyrine (Acetosalicylate of Antipyrine) is a white crystalline powder possessing all the antipyretic and analgesic properties of antipyrine without causing cardiac depression. It is useful in acute rheumatism, phthisis, and migraine, and has been recommended in gonorrhœa and bronchitis. The dose is 10 grs. in mucilage and water or in cachets.

Acid. Alpha-Oxynaphthoicum is naphthol carbonic acid, existing in reddish masses, scarcely soluble in water, though it dissolves in glycerin and oils. It costs little and has powerful antiseptic properties, being five times stronger than salicylic acid. It has been used as a disinfectant and as an ointment (5 per cent.) in scabies, but like the beta acid it is too irritating for internal use.

Acid. Cacodylicum contains over 54 per cent. arsenium, which is equivalent to 71.4 per cent. arsenious acid. Cacodylate of soda contains arsenium equivalent to almost 62 per cent. arsenious acid. Arsycodile is a similar compound salt. These substances have been vaunted as almost specifics in many diseases formerly treated by arsenic, as tuberculosis, pernicious anæmia, leucæmia, syphilis, malaria, trypanosomiasis, goitre, psoriasis, etc., chiefly upon the grounds that enormous doses of arsenic can be safely and easily introduced into the system by their hypodermic and stomach administration. Thus $\frac{3}{4}$ to 1 gr. of the soda salt may be given hypodermically dissolved in 15 to 20 mins. sterilised water once daily for considerable periods without danger. It is, however, advisable to stop the injections after 10 days for one week, and then begin again. $\frac{1}{2}$ to $\frac{3}{4}$ gr. may be given in pills or by the rectum. A powerful alliaceous odour soon taints the breath, and the appetite fails. The usual hypodermic dose ($\frac{3}{4}$ gr.) can be obtained in sterile glass capsules. Fraser has shown that when a salt of cacodylic acid is administered, it is absorbed and eliminated, but with the arsenic which it contains so firmly combined with the other cacodyl constituents that it does not become dissociated, and that it is thus therapeutically powerless, the arsenic ion remaining pharmacologically inert. He found that the urine of patients taking the salt did not give up its arsenic when treated by Marsh's process until its

organic constituents had been destroyed by a prolonged and elaborate process of oxidation. Cacodylate of iron (1 gr. doses), however, when given hypodermically, is valuable because of its base, which acts as any other iron salt will act; the cacodylate group remains incapable of dissociation, its arsenic continuing firmly united with methyl. The cacodylates have not sustained their reputation in pernicious anæmia, though surprising temporary improvement often follows; of late they have been much used in tuberculosis with promising results. Cacodyliacol, or the cacodylate of guaiacol, is injected into tuberculous joints or given by the mouth in 1 to 2 gr. doses. It is a dangerously unstable salt. Mercury cacodylate is also a dangerous salt, and causes irritation if injected. Magnesium cacodylate is equal in value for hypodermic use to the soda salt. (See under Atoxyl and Arrhenal.)

Acid. Camphoricum.—This white, odourless acid is obtained by the action of nitric acid on camphor. Reichert has found that it exercises a marked destructive action upon the tubercle bacilli in the body when a solution is injected into the peritoneal cavity. It has been used in laryngeal phthisis, coryza, etc., applied as a spray or linctus in 4 per cent. alcoholic solutions. It has been given internally in cystitis and incontinence of urine, and in a host of nervous diseases, as epilepsy, chorea, etc., and in acne, in doses of 5 to 10 grs. Its best effects are seen in the treatment of tubercular diarrhœa and in the night sweats of phthisis. Stockman and Hare testify to its value in this latter condition. Hare gives 20 grs. in cachets one or two hours before the sweating is expected. A 1 to 2 per cent. solution has been used for washing out the bladder in obstinate cystitis, and 5 grs. every 4 or 6 hours will disinfect the urine in cystitis when salol fails.

Acid. Catharticum is a brown, nearly tasteless, soluble glucoside obtained from senna. It has been given to children in constipation, dissolved in sweetened water, in doses of 1 to 2 grs.; 6 grs. may be given to adults. It gripes less severely than senna. The purgative principles of senna are the magnesium and lime salts of this acid, but probably other cathartic substances are also present. The pure acid is unstable.

Acid. Cinnamicum, or Cinnamylic Acid, exists in micaceous, inodorous crystals, obtained by oxidising oil of cinnamon. It is only slightly soluble in water, but is a powerful antiseptic, and possesses remarkable power of increasing the number of the white blood cells, and has been vaunted as an intravenous injection for the cure of tuberculosis. The soda salt is soluble, and has obtained, under the name of Hetol, an extensive trial in various forms of tuberculosis when given by the mouth (2 to 5 grs.), but more particularly when injected into the veins (1 in 20) or hypodermically into the tissues surrounding a tubercular nodule, as in lupus. Hydrocinnamic acid (Beta-phenyl-propionic Acid) in 1 gr. doses, and cinnamate of strontium 2 to 5 grs. possess similar action. Cinnaldehyde or Cinnamal and Coumaric Acid, and its ortho-, para-, and meta-sodium salts have been injected in cancer, tuberculosis, and typhoid fevers. Under the name of *Tylmarin*, Martindale has introduced Acetyl-o-coumaric acid in colourless crystals, administered in 5 gr. cachets or tablets in inoperable cancer, tubercular adenitis, phthisis

and septic intestinal troubles. *Zimphene* or sodium-meta-oxy-cyano-cinnamate in 1 gr. doses is used in dyspepsia and tuberculosis.

Thermiol is the name given to the sodium salt of phenylpropionic acid, used as a spray solution in laryngeal tuberculosis.

Acid. Cresylicum (Cresyl or Crude Cresol) is a yellowish liquid obtained from coal-tar oil; it is a mixture of the three isomeric cresols—ortho-, meta-, and para-; the latter is the chief constituent of *crude* commercial carbolic acid. A purified form of cresylic acid is known as Trikresol, used extensively in Germany in 1 per cent. solution as an antiseptic; it contains all three cresols, and is much more powerfully antiseptic than carbolic acid. Under the name of Kresolum, the ortho-cresol is used for similar purposes. Creolin is a variable product containing different percentages of cresols; Kelvolin is a 40 per cent. mixture, and Pearson's contains half this amount. Lysol is a 50 per cent. mixture, obtained as a dark yellow liquid by saponifying oil of tar and fats with potash. A similar stronger liquid is known in the Continental pharmacopœias as *Liquor Cresoli Saponatus*. Jeyes' Fluid is a tar-oil preparation, containing 20 per cent. tricresol saponified with resin and alkali.

Artmann's Creolin resembles Pearson's and Jeyes'; it is a solution in sulpho-cresylic acid of tar hydrocarbons. Lysulfol is a black greasy solid compound of lysol and sulphur used with an equal quantity of glycerin as an application for scabies. Solutol is a caustic solution of the cresylate of soda in excess of cresol, used only as a disinfectant. Solveol is a neutral solution of a combination of sodium cresylate with cresols intended for internal use in tuberculosis in doses of 20 mins. thrice daily. Enterol is a liquid mixture of the three cresols introduced as a urinary antiseptic; 1 dr. of a 1 in 500 solution may be given in gonorrhœa and cystitis. Metakalin is a solid cresol preparation supplied in 15 gr. tablets, each of which, dissolved in 100 c.c. water, makes a 1-per cent. solution, used as an antiseptic and disinfectant; larger masses, called cartridges, contain $2\frac{1}{2}$ drs. for solution in a litre of water.

The Salicylate of Cresol or Cresalol exists in the three forms of ortho-, meta-, and para-; these have been used as iodoform substitutes, the meta- especially. The para- salt has been given internally in 5 gr. doses as an intestinal disinfectant.

The Iodide of Cresol is a yellow powder introduced as a substitute for iodoform, being a powerful antiseptic.

Losophan is meta-tri-iodi-cresol, a crystalline powder without odour, containing 80 per cent. iodine used as a 5 per cent. ointment or 2 per cent. alcoholic solution in parasitic skin diseases.

Cyllin—closely allied to cresol—contains 60 per cent. of oxidised hydrocarbons, with a diphenyl nucleus replacing the single phenyl nucleus of carbolic acid (Martindale). The dose of Jeyes' Medical Cyllin in keratin-coated capsules is 3 to 5 mins., administered as an intestinal antiseptic in diarrhœa, colitis, sprue, and dysentery, and as an agent against tuberculosis. Cyllin is used as an antiseptic lotion $\frac{1}{2}$ per cent., and as a gauze, ointment, lint, and inhalation.

Of the three forms of Cresotinic Acid, the para- is the only one used in the form of the Paracresotinate—a white crystalline powder employed in rheumatism as a substitute for the salicylates in 20 gr. doses. The calcium salt is used as a disinfectant.

Acid. Formicum is a colourless liquid representing about 25 per cent. real acid, introduced by Clément. Hypodermic injections of 10 mins. of a 2 per cent. solution are recommended in muscular rheumatism by those who believe in the curative powers of bee stings; the injections are painful, and require a previous injection of cocaine. 5 to 15 mins. may be given by the mouth, largely diluted with aerated water. Sodium formate has been given in doses of 5 to 10 grs. thrice daily.

The drug has been vaunted as a powerful muscular tonic, increasing the force of the heart-beat and augmenting the tone of the skeletal muscles; it has been used extensively in diphtheria in combination with serum treatment, and it is claimed that its administration has considerably lessened the mortality. It diminishes the tremor in chorea and paralysis agitans, and acts as a diuretic. The list of diseases recently reported as benefited by the hypodermic and mouth administration of the formates is a long one, and includes tuberculosis, chronic nephritis, gout, sciatica, asthma, impotence, pneumonia, anorexia, inoperable cancer, tertiary syphilis, intestinal sepsis, psoriasis, lupus, heart failure, neurasthenia, etc.

The sodium salt is less painful for hypodermic medication; the calcium salt is recommended highly as a remote hæmostatic, and the lithium salt is used in gout. Thephorin (theobromine-sodium-sodium formate) acts as a diuretic in the same doses as diuretin. Formic ether (ethyl formate) in 30 min. doses has a similar action. Forgenin (tetramethyl-ammonium-formate) in doses of $\frac{1}{4}$ gr. hypodermically raises arterial tension without increasing the pulse rate, and is recommended in the late stages of pneumonia and other septic conditions in which digitalis is indicated. As an instillation, a 2 per cent. solution of the sodium salt is used in cases of insufficiency of the ocular muscles. Formic acid is a powerful antiseptic, and is recommended highly as a food preservative.

Acid. Glycerophosphoricum and its many salts act as powerful restoratives; after absorption they have an accelerating action upon nitrogen metabolism, and Robin believes that their use tends to the saving of nerve energy. Glycerophosphates are formed from lecithin during the progress of digestion, and since lecithin is a constituent of the nervous system and of the secretion of many glands and organs it and the glycerophosphates have been given in neurasthenia, malnutrition, brain diseases, neuralgias, and rickets. The number of red cells is found to considerably increase under their use, but they are not believed to supply free phosphorus to the blood or tissues, though there can now be little doubt that the organic phosphorus contained in them is capable of being used up by the active cells in the brain and other tissues.

Tunnicliffe maintains that the administration with the food of the calcium glycerophosphate salt, unlike calcium phosphate, leads to an increased assimilation of nitrogen and to an *increase in the retained phosphorus*, and many other authorities believe that the glycerophosphates must be regarded as more than agents which merely stimulate metabolism. In tuberculosis their benefits have been of late years appreciated by an increasing number of observers; Michelozzi was able to demonstrate this curative power of the calcium salts in tuberculous rabbits, but his doses (45 grs. daily) were

colossal, considering the small weight of the animals. In the treatment of human tuberculosis this dose is seldom exceeded ; some physicians inject daily 10 grs. in aqueous solution hypodermically.

Sanatogen is a well-known proprietary artificial food, consisting of casein in chemical composition with glycerophosphoric acid, the casein itself containing its own organic phosphorus in addition to the organic phosphorus contained in the sodium glycerophosphate. The interesting and valuable researches conducted by Tunncliffe and by Beddoes upon metabolism, in which Sanatogen was experimented with, establish the fact that its organic phosphorus is almost entirely assimilated when the food is administered in the amount necessary for the needs of the body. When given in addition to other food, the amount of nitrogen and phosphorus retained in the organism is increased, the tissue metabolism is more complete, the constituents of the ordinary food being more thoroughly utilised ; appetite is increased and body-weight augmented. The administration of inorganic lime and soda phosphates produced no such results, the phosphorus in these salts being neither assimilated nor retained in the system ; nor did their administration in any way assist the assimilation of the nitrogenous elements of the food used at the same time.

In neurasthenia, neuralgic conditions, rickets, and all forms of malnutrition and debility following severe septic conditions this form of food is clearly indicated, and Ewald has proved its value in the treatment of typhoid fever.

Phytin resembles the glycerophosphates in action, and contains nearly 23 per cent. organic phosphorus in the form of the calcium-magnesium salt of oxymethylene diphosphoric acid ; it is a white powder of vegetable origin, given in 4 gr. tablets in rickets, scrofula, neurasthenia, etc. Quinine also forms a salt with this anhydro-oxymethylene-diphosphoric acid which is known as Phytin Quinine. It is valuable in malaria when given in 5 gr. doses.

The potash and soda salts may be given hypodermically in 5 gr. doses, and the iron, quinine, manganese, and lime salts by the mouth in similar doses 4 times a day in neuralgia, influenza, hysteria, etc. The best preparations are the syrups, of which there are two—Robin's and the B.P.C. syrups, the doses of which are 1 to 2 drs. *ter die*.

Acid. Hydrofluoricum is a powerfully corrosive liquid, readily attacking glass, and causing a deep destruction of animal tissue. The diluted acid (1 in 500) has been successfully given in goitre by Woakes, in doses of 20 to 60 mins. The fumes of the acid have been inhaled in diphtheria, pertussis, and phthisis, but it has fallen into disuse. Fluorides of quinine, ammonium, and iron have been administered in cases of splenic enlargement—5 to 30 mins. of a 1 in 120 solution. Salufer is the name of a disinfectant consisting of neutral silico-fluorides. Under the name Antitussin, an ointment consisting of 5 per cent. of difluor-diphenyl in lanoline and vaseline, is vaunted as a specific in whooping-cough. It is, however, most unreliable, and sometimes causes skin ulcers. Fluor-rheumin and Antirheumin are similar applications, containing, in addition, Fluorphenetol. Gaseous Fluoroform, $2\frac{1}{2}$ per cent. in water, known as Aqua Fluoroformi, has been extolled in 1 to 2 dr. doses in pertussis

and all forms of tuberculosis. Silver Fluoride (Tachiol) is a powerful antiseptic existing as a soluble yellowish powder, a 1 in 2,000 solution being used in gonorrhœa and ophthalmia ; it blackens linen like marking-ink.

Acid. Hypophosphorosum and Syr.—The hypophosphites of lime, ammonium, iron, manganese, potash, and soda are given in 5 gr. doses, but the B.P.C. compound syrup is the best form for administration ; it resembles Fellows' syrup, and is a favourite nervine tonic and anti-tuberculosis agent (see p. 344).

Acid. Iodicum has been reintroduced as a mild caustic in eye surgery. With a little water and acacia it is moulded into rods which are applied to trachoma, ulcers of the cornea, etc. Subcutaneous injections of 1 gr. of iodate of soda in chronic articular rheumatism have given good results. Mercuric iodate has been used as an antiseptic, like corrosive sublimate, and it has been given in $\frac{1}{4}$ gr. doses in syphilis. Calcium, bismuth, and zinc iodates are used as dusting powders like iodoform. The pure acid is a valuable test for aceto-acetic acid in diabetic urine.

Acid. Osmicum (Perosmic Acid) was found by Bilroth to cure sciatica which had resisted treatment for years, when injected deeply between the ischium and trochanter.

15 mins. of a freshly prepared 1 per cent. solution should be injected deeply into the substance of the nerve ; the writer has obtained best results by injecting 2 or 3 mins. in several places deeply along the course of the nerve, so that some of the injections are sure to penetrate its sheath. It has also been injected in trigeminal neuralgia with success. Rabcock states that the acid is useless unless the nerve is penetrated, and such a degree of local destruction effected as will cause a firm scar, rendering the nerve insensible to sensory impulses. It has been injected into strumous glands, cancers, and goitres, and deeply into the muscles in lumbago and muscular rheumatism, but with varying success. Wildermuth used it in intractable epilepsy, but found better results from $\frac{1}{64}$ gr. osmate of potassium in pill, 15 of which was the maximum daily allowance. This salt in 1 to 2 per cent. solution is also suitable for injection in neuralgia.

Acid. Picricum (Trinitro-phenic or Carbazotic Acid) has been introduced as a test for sugar and for albumin in the urine ; a saturated solution of the acid in water throws down a cloud, even when the albumin is in small quantity. It is of great value in burns and scalds, when applied on lint soaked in a watery solution of 1 in 100, and the parts bandaged in wool ; the dressing need not be changed for two days, and no impervious covering should be placed over the lint, the solution being allowed to dry by absorption and evaporation. The same method should be used in treating acute eczema, which rapidly heals under this plan.

It has been tried in erysipelas, with advantage. The saturated solution should be painted over the affected parts. Its application generally produces yellowness of the skin. Dr. H. Monypeny gives 1 gr. doses as a bitter tonic, and reports favourably of it ; the picrate of ammonia in 1 gr. doses has been successfully used in exophthalmic goitre and malaria. Recently glowing reports of the

value of inhalations of picric acid in phthisis have appeared; the acid is boiled in water, and the steam inhaled for several hours daily.

Acid. Pyrogallicum (Pyrogallol) constitutes the white feathery crystals which sublime upon heating gallic acid. It is a powerful antiseptic from its affinity for oxygen. Introduced by Jarisch, it has been found useful in the form of his ointment (1 dr. to 1 oz. of lard) when brushed over the patches of psoriasis. If applied in concentrated form, it is a powerful local irritant, and has been used to cause the destruction of epithelial cancers, chancres, lupus, etc. It stains the skin and hair dark, though not so deeply as goa powder.

1 gr. in solution every hour has been given in internal hæmorrhages, but it is a *dangerous* drug, and should never be administered internally. Alarming symptoms have followed the application of the ointment, which should only be applied to limited surfaces, and several deaths have occurred in psoriasis from its use. It breaks up the red blood cells, and causes hæmoglobinuria and jaundice. Vidal applies it in powder mixed with four times as much starch, and blown upon phagedenic chancres, or applied as an ointment (1 in 6). The writer has seen sloughing follow its use, and he has ceased to employ the drug, even externally, owing to its dangerous properties.

Lenigallol (Triacetate of Pyrogallol) is much safer and milder, and may be used in a paste with zinc oxide and starch (1 in 4) or acute and chronic eczema, where it lessens both the hyperæmia and itching.

Eugallol (Monacetate of Pyrogallol) and Saligallol (the di-salicylate) are powerful drugs only used externally in psoriasis after solution in acetone.

Pyrogallol oxide, or Pyraloxin, is a brown soluble powder, prepared by oxidising pyrogallic acid. It is quite as efficacious as the acid; it is free from danger, does not blacken the skin, and its external use in ointments and lotions (1 in 10) does not darken the urine. Unna has obtained marked success with it in leprosy, the entire skin being rubbed with an ointment of 5 parts with 6 of salicylic acid and 90 of lanoline, 40 grs. of the powder being administered daily in syrup at the same time. He uses successfully a 1 in 300 solution as an instillation in incurable chronic conjunctivitis.

Gallacetophenone is an allied substance, obtained as a brown powder from pyrogallol, and used as a 10 per cent ointment in psoriasis, chronic eczema, and parasitic skin diseases; like the oxide, it does not blacken the skin.

Acid. Quinicum obtained from cinchona is a crystalline soluble white substance, which becomes changed into benzoic acid in the system, which then unites with glycocholl, and is finally excreted as hippuric acid. The formation of uric acid is markedly diminished under its administration in 5 gr. doses. It has been used in gout, and the reports of many Continental observers are striking. The following compounds are in use—Urosin (Lithium quinate), Urol (Urea quinate), Sidonal (Piperazin quinate), Quinotropine (Urotropine quinate). These may be given in 15 gr. doses in all gouty

conditions. New Sidonal is the anhydride of quinic acid ; it very markedly diminishes the amount of uric acid secreted when given in 10 gr. doses.

Acid. Scleroticum is one of the principles found in ergot. It is doubtful if it will cause contraction of the uterus, and the results attributed to its action have been caused by other principles of ergot which were incorporated with it. When injected in large doses, it causes spinal paralysis. It may be given hypodermically in doses of $\frac{1}{2}$ gr. dissolved in 5 mins. of water. The solution must be fresh ; the substance itself is very hygroscopic.

Acid. Trichloraceticum is a deliquescent, crystalline antiseptic body soluble in water. Applied to the skin, it acts as a powerful but comparatively painless caustic, destroying warts and granulation tissue. 1 per cent. solutions destroy nearly all forms of bacterial life without causing irritation of the skin, and have been found useful as a dressing for wounds, ulcers, venereal sores, erysipelas, gonorrhoea, etc.

It gives excellent results in the concentrated form when applied as a caustic in chronic or granular pharyngitis. A 50 per cent. solution is used like cold nitric acid as a test for albumin in the urine, and under the name Acetocaustin it is introduced as a caustic. Mono- and dichloracetic acids are also used as caustics.

Acid. Trichlorphenicum, known as Trichlorphenol, is derived from carbolic acid, and exists in acicular crystals. It is stated to be 25 times stronger than carbolic acid. It is insoluble in water, but forms soluble salts with alkaline bases which have been used as antiseptic dressings and as disinfectants, being much stronger than carbolates. The magnesium salt, 4 grs. to 1 oz., has been used in conjunctivitis and purulent ophthalmia. (See under Paramonochlorphenol.)

Actol (Lactate of silver) has been introduced by Cr  d   as a powerful germ destroyer. He injected the remedy ($\frac{1}{8}$ gr. in 7 mins. water) into the subcutaneous tissue of the abdominal wall in hopeless cases of anthrax with success, and also in a more dilute solution in erysipelas with similar results. The injections should be made under cocaine. 2 grs. in 10 ozs. water may be used as a gargle or lotion, and 5 grs. in 10 ozs. may be injected in gonorrhoea.

Adonis Vernalis resembles digitalis in its action ; it contains a glucoside—adonidin—which has been given in cardiac diseases, where it has strengthened the ventricular contractions, and reduced the frequency and increased the strength of the pulse, with very little action upon the arterioles. It is not cumulative. It is doubtless a remedy of great power, but it is doubtful if it will accomplish in failing compensation as good results as digitalis. It is, however, more rapid in action, and it can be given in the intervals when digitalis is suspended. One tablespoonful of an infusion ($\frac{1}{4}$ oz. to 10 ozs.) should be given every three hours. The drug has been recommended in epilepsy with bromides.

Merck's Adonidin should be preferred to the crude drug ; it is hygroscopic, but keeps well in chloroform water. $\frac{1}{10}$ gr. may be given 4 or 6 times daily. A 1 per cent. aqueous solution instilled into the conjunctiva has marked analgesic action like cocaine, and it relieves the severe pain of glaucoma.

Æsculus Hippocastanum (Horse-chestnut) has been recommended in diseased conditions of the rectum and anus, as in painful hæmorrhoids, especially where there is little bleeding and no constipation. Mayhoffer has found it effective in pharyngo-laryngitis. Anti-arthrin is a preparation containing this drug along with salicin as an antirheumatic specific.

Æsculin, a glucoside from the rind of the fruit, has been recommended in malaria; it has given good results in the treatment of lupus when injected near the spot previous to the use of Finsen rays, owing, it is believed, to its remarkable fluorescent properties. Æsculin is not to be confounded with Escalin, which is finely powdered metallic aluminium, used successfully as a suppository in anal fissure, hæmorrhage, and piles. Æscorcin, a derivative from æsculin, is used to detect defects in the cornea owing to its temporary red staining (10 per cent. solution).

The leaves of the American edible chestnut (*castanea*), almost identical with the Spanish chestnut, have been useful (in 1 dr. doses of the liquid extract 1 in 1) in pertussis.

Æthyl Bromidum (Bromide of Ethyl, or Hydrobromic Ether) is a liquid obtained by distilling a mixture of phosphorus, alcohol, and bromine. It is used as an anæsthetic, especially in ophthalmic and dental practice. Its action upon the heart and respiration is the same as that of chloroform, from which it differs in the *rapidity* of its action (1 to 3 minutes) and the *promptness* with which patients come from under its influence; it has, however, the drawback of being more irritating to some patients. It certainly has been demonstrated to be more dangerous than chloroform or ether, and as a general anæsthetic its use should be abandoned, unless Merck's pure preparation is used. Anæsthesia having been induced by the drug, it may be kept up by chloroform for indefinite periods. It is especially dangerous when phthisis, renal, or cardiac disease is present. It is decomposed readily by light, and should be perfectly colourless. It is not inflammable, and is valuable for its *local* anæsthetic effect, which can be produced by simple contact with a little of the liquid on lint, covered or not with oiled silk, or better still by being sprayed upon the part by a spray producer, though freezing of the part is unnecessary. It has also been administered internally as an antispasmodic.

Kelly has shown that it is so frequently found impure as to be unfit for use. He speaks well of the pure drug in throat surgery, but points out the dangers of its action in general surgery.

Bromide of Ethylene ($C_2H_4Br_2$), a heavy, sweet chloroform-like liquid, containing 90.9 per cent. bromine, formerly tried as a general anæsthetic, but now discarded because of its dangers, should not be confused with Bromide of Ethyl. It has been given in the capsular form (1 to 2 mins.) for epilepsy.

Æthyl Chloridum is a colourless ethereal, inflammable gas, easily condensed into a liquid, closely resembling sulphuric ether in its action; it is introduced as a local anæsthetic for neuralgia, toothache, and minor operations. It may be used in the form of a spray, or by being expelled through a capillary tube in a fine jet it soon produces insensibility in the area to which it is applied, by causing

rapid freezing of the skin, the heat of the operator's hand being sufficient to expel the liquid gas. The skin should be carefully freed from grease before applying the liquid, which should be held about 6 or 8 inches from the part to be frozen. Narcotile, Somnoform, Coryl, and Anestile are fancy names given to mixtures of this substance and methyl chloride (which see) sold for local anæsthesia in screw-tapped cylinders.

Chloride of Ethyl has been much used as a general anæsthetic of late ; it is very suitable for short operations like teeth extraction, and Herren Knecht maintains that it is safer than even nitrous oxide. The anæsthesia is often induced in two or three minutes, and passes off rapidly. When prolongation of the unconsciousness is necessary, chloroform anæsthesia can be resorted to.

☞ This substance is also known as Kelene and as Hydrochloric Ether. Chloride of Ethyl is wrongly used as a synonym for Ethidene Dichloride.

Æthyl Iodidum, or Hydriodic Ether, is a liquid prepared in the same way as ethyl bromide, by substituting iodine for bromine. It has been tried with success in cardiac dyspnœa and in spasmodic affections of the larynx and bronchial tubes, and has been used as an inhalation in bronchitis and catarrhal laryngitis, in syphilitic ulceration affecting any part of the air tract, in laryngeal tuberculosis and pertussis. It is an expectorant, and often gives relief in asthma, by cutting short the attack or rendering the breathing easy and deep. It should be used like nitrite of amyl, and can be had in glass capsules, 5 mins. in each, as recommended by Martindale. It affords the best method of saturating the system rapidly with iodine, upon which substance the activity and efficacy of its action to some extent depend ; 3 or 4 capsules may be used at a time. When painted on the skin and covered with wadding and oiled silk it is rapidly absorbed, and the system may be saturated with iodine in this manner.

Agar-Agar, known as Gelosin and Japanese Isinglass, is the dried jelly existing in ribbon-like membranous pieces, prepared from a species of seaweed—*Gelidium corneum*. In sterilised solution it has been injected into the tissues with the view of causing their condensation round hernial openings, etc. Recently it has been successfully employed as a mild purgative. Under the name of Regulín a dry, tasteless preparation of agar-agar has been introduced, which contains 20 per cent. of extract of cascara. It acts in chronic constipation as a mild laxative in doses of 1 to 3 drs. by increasing the bulk of the fæces. It should be taken mixed up with mashed potatoes or stewed fruits. Recently the agar-agar has been used without cascara, a teaspoonful of the dried shreds giving excellent results, without griping or purging.

Agaricus Albus, White or Purging Agaric, is a fungus growing upon the old trunks of the larch. Is not to be confounded with Fly Agaric, the brilliantly coloured fungus which contains muscarine.

15 grs. of the powdered fungus, or $\frac{1}{2}$ gr. Agaricin or Agaric Acid (a white crystalline powder) has a very decided action in checking the night sweats of phthisis. It was formerly used as a purgative, and in large doses causes watery stools ; in small doses it checks

diarrhœa and dysentery, and is useful in hæmoptysis ; it diminishes the secretion of the bronchi and mammae.

Moderate perspiration yields to a single $\frac{1}{6}$ gr. dose, whilst profuse sweating requires repeated equal or increasing doses for its suppression, the physiological action of the drug manifesting itself five hours after its exhibition without any undesirable symptoms. It is best given in the pill form with a grain of Dover's powder.

Albargin (Silver Glutin, Gelatose Silver) is a light yellow soluble powder containing 15 per cent. of silver. It is a compound of silver and gelatose, a substance derived from glue. It is introduced as an anti-gonorrhœa remedy, and is superior to protargol in many respects. It is injected in solution 1 in 500 *ter die*. Many recent reports establish its efficacy when used as an instillation (2 per cent.) in ophthalmia neonatorum and phlyctenular ophthalmia.

Alembroth Salt (Ammonio-Mercuric Chloride) is the substance formed when solutions of corrosive sublimate and sal ammoniac are mixed together. It exists in rhombic prisms which are very soluble in water, and which do not very readily combine with albumin. For this latter reason it is prized as an antiseptic dressing, being much less irritating than solutions of pure sublimate. It is the salt which some authorities recommend for hypodermic injection in syphilis. Bloxam uses the following solution for this purpose :— 32 grs. sublimate, 16 grs. chloride of ammonium, in distilled water 2 ozs. ; the dose of which is 10 mins. 3 grs. sal alembroth contain 2 grs. sublimate. As a dressing it is generally used in the form of gauze containing 1 per cent., and coloured blue by aniline. The pink gauze—Eucalembroth—contains in addition eucalyptus oil.

Allium, or Garlic.—The volatile oil—Sulphide of Allyl—obtained from the clove of garlic and from the common leek, is a powerful expectorant of the stimulating class, and markedly increases the bronchial secretion, and renders it less difficult in being expelled. Garlic appears to act like the onion (see Sulphur) upon the bronchial mucous membrane during the process of excretion by this channel. It is valuable also as a rubefacient in bronchitis, and is a certain anthelmintic, killing the round worm. It is a powerful antiseptic, and in the concentrated form will produce vesication, purging, and vomiting. The oil is not given internally owing to its irritant qualities, but the fresh juice in 30 min. doses, or the tincture of the bulblets (1 to 5) in dessertspoonful doses, will act as a valuable expectorant and diuretic. Martindale describes an *essential oil* prepared from the leek which contains no sulphide of allyl, though it has similar action. It may be given in 2 min. doses in capsule.

Almatein is a tasteless and odourless condensation product of hæmatoxylin and formaldehyde, possessing powerful antiseptic properties without toxicity. It is used as an iodoform substitute externally, and internally in 20 gr. doses in tablets as a harmless intestinal disinfectant, which passes through the stomach unchanged.

Althæa (Marshmallow Root) has been long recognised as a valuable demulcent and emollient, and enjoys great popularity in bronchitis and catarrhs. It also possesses feeble diuretic properties from the asparagin contained in it (see below). The entire plant—leaves and young branches—made into a fomentation (4 ozs. of the dried herb

to 1 pint), has been used to prevent suppuration and to relieve pain and tension in the inflamed mammary gland and in various acute joint affections. An ointment made by boiling the chopped leaves in lard (1 to 1) and straining has been in use for a variety of skin affections, and has been recommended in the treatment of palmar psoriasis.

Althein is a crystalline body identical with *Asparagin* (Amido-succinic acid amide), and may be obtained from the root of marsh-mallow and asparagus. It possesses diuretic qualities, and is, in medicinal doses (2 grs. dissolved in 4 drs. of water), a valuable remedy in cardiac dropsy, Bright's disease, and gout.

Alumen Ammonio-Ferric. (Iron Alum).—This pale violet-coloured salt is an ammonia iron-alum, in which ferric oxide replaces oxide of aluminium.

It possesses stronger astringent properties than ordinary alum, is more soluble and less irritating in small doses, and may be used where an unstimulating iron salt is indicated with a good astringent. It is used in hæmorrhage from the kidneys, and especially in intermittent hæmaturia; 5 to 10 grs. given four times a day will sometimes be found to diminish the albumin in Bright's disease. 1 dr. to 8 ozs. water makes a good astringent gargle in relaxed and inflamed conditions of the throat.

Aluminium Aceto-Tartrate is very readily soluble in water; it has a pleasant taste, and is not poisonous. A solution known as *Alsol* has been long used as a disinfectant. It possesses powerful antiseptic properties, and is more stable and easily prepared than the Acetate of Aluminium, which is a much less powerful antiseptic. The Liq. Aluminii Acet. P.G., 1 in 4, in orange flower water is the astringent mouth wash used at Aix during inunction treatment.

Aluminium borico-tartrate (or Boral) and the tannate (or Cutol) are used as ointments (10 per cent.), or powders in eczema, ulcers, etc. The soluble tannate or Tannal, and the corresponding Gallal, are useful when tannin is indicated. (See also under Salumin.) The Caseinate has recently been used as an astringent (4 to 5 grs.).

Alumol is the name given to an aluminium naphthol sulphonate in the form of a white soluble powder. It is a powerful astringent and precipitates albumin, but the ppt. is soluble in excess. It is powerfully antiseptic, and 1 to 2 per cent. solutions are used for otitis, gonorrhœa, leucorrhœa, conjunctivitis, endometritis, and 5 per cent. ointments for ulcers and chancres. A 20 per cent. solution is used as a caustic. Sozal is the sulphocarbolate of aluminium prepared from phenol; it possesses properties similar to alumol. The Formate and Boroformate of aluminium have the same action and indications as alumol. Aluminium chloride has been recommended in 4 gr. doses to relieve the lightning pains of ataxia, and the Lactate, under the name of *Fixin*, is recommended as a gastro-intestinal disinfectant.

Kaolin (p. 243) is native white aluminium silicate.

Alpin—a synthetic substitute for cocaine—is the hydrochloride of Benzoyl-tetramethyldiamino-ethylmethyl-carbinol in a white soluble crystalline powder. Its solutions should be prepared fresh; the 2 per cent. liquid produces anæsthesia of the conjunctiva within

a minute, no effect being noticed on the pupil. The internal dose is the same as for cocaine, but it is less toxic. It may be used with adrenalin and the nitrate salt with lunar caustic.

Ammonal is an ammoniated derivative of antifebrin, existing as a white powder soluble in about 100 times its weight of water. Martindale gives its composition as acetanilide, sodium bicarbonate, and ammonium carbonate. It is given in doses of 5 to 10 grs. in tablets in all the conditions where antifebrin is indicated, but it is especially extolled for the relief of the pains of dysmenorrhœa. The Salicylate, Lithiate, and Bromide of ammonal are given in similar doses. Phenalgin is another ammoniated derivative of antifebrin used in doses of 5 to 20 grs.

Antiseptin (Bromacetanilide) is monobromphenylacetamide, and is given in the same dose as acetanilide, over which it possesses no advantages. Antitoxine, Antikamnia, Antinervin, and Daisy powders are said all to owe their properties to antifebrin. They are inferior to the B.P.C. Pulv. Acetanilidi Co., which consists of acetanilide 7, caffeine 1, and sodium bicarbonate 2.

Neuronal is bromo-diethyl acetamide, and contains 41 per cent. bromine. It has been successfully used in 10 to 15 gr. doses as an hypnotic in epilepsy, mania, and in simple insomnia.

Hydracetin (Acetylphenylhydrazin), introduced as an antipyretic, is now discarded, owing to its toxic properties, though it is still recommended as an application in parasitic skin diseases.

Amyl or Anodyne Colloid is a thick liquid used for painting over the course of painful nerves in neuralgia, sciatica, etc. It is prepared by dissolving 6 grs. veratrine, 1 gr. aconitine, in $\frac{1}{2}$ oz. hydride of amyl (Pentyl hydride) and $\frac{1}{2}$ oz. absolute alcohol, and adding 1 oz. collodion.

Amyl Salicylate is introduced as a substitute for methyl salicylate—the synthetic oil of wintergreen. It is much less irritating, and its odour is mild. It is applied externally over rheumatic joints and then covered with wool, and it is given in 5 min. doses in capsules. Salit, or borneol salicylate, prepared from Borneo camphor, has similar action and uses; it is generally diluted with its bulk of olive oil for application to rheumatic joints.

Amylene Chloral, also called Dormiol, is an oily pungent liquid obtained by acting upon chloral with amylene hydrate. All that is said of the following remedy may be applied to it, only that the dose is considerably less—15 mins. being an average amount for one administration. It is much praised in the insomnia of mental diseases, and Hoppe reports most favourably of it in the status epilepticus when given by the rectum in 40 gr. doses in water.

Amylene Hydrate is a colourless tertiary alcohol acting like chloral, but with little depressing effect upon the heart. There is little or no preliminary excitement, sleep occurs often in a few minutes; it seldom fails in its action even in those accustomed to narcotics, and no after ill consequences follow on awaking. It may be safely given to children. To adults it may be given in drachm doses in claret or suspended in a flavouring syrup, or it may in the same dose be administered by the rectum, or given in capsules. Its strong taste and smell, and its high cost, are barriers to its use. No ill effects

have been noticed after doses as high as 2 drs., but occasionally symptoms resembling alcoholic poisoning have been recorded. It has been used successfully in delirium tremens, mania, eclampsia, etc., and Wildermuth has obtained excellent results in epilepsy of a severe type where bromides fail, also in petit mal and in pertussis. It should not be given in epilepsy till a considerable interval after the cessation of bromide treatment. It has been recently found to remarkably relieve the thirst in diabetes insipidus in small doses (15 mins. *bis in die*). The drug is also known under the name of Dimethylethylcarbinol-chloral.

Amyli Iodidum consists of iodine 5 parts, triturated with a little distilled water, and rubbed carefully with wheaten starch 95 parts. It is used as a means of administering iodine, and may be given in doses of 2 drs. rubbed up in milk or water. It can be employed as a dry dressing in every case in which iodoform is indicated. It has also been recommended as an antidote in poisoning when the nature of the poisonous drug is unknown. (Similar compounds with bromine and chlorine are prepared, and they may be taken in similar doses; they are known as bromide and chloride of starch.) Iodide of Starch Paste is made by boiling starch 1, glycerin 2, and water 6, and when cold adding $\frac{1}{2}$ part liniment of iodine. It is used as a poultice to foul syphilitic and other ulcers.

Anacardium (Cashew Nut).—The oily liquid obtained from the pericarp has been held to be a cure for leprosy. It contains 90 per cent. of anacardic acid, and 10 per cent. cardol. Internally it has been given as an anthelmintic, but it is chiefly used as an external application to ringworm and leprous ulcerations. It has been seldom employed in this country. Cardol, its active principle, is used as a blistering oil.

Anæsthesine is the ethyl ester of para-amido-benzoic acid allied to novocain; it is a tasteless white powder possessing marked local anæsthetic action. 5 grs. in wafer relieve gastric pain, and the same amount in a suppository relieves rectal tenderness and pruritus. It is suggested as a dressing for ulcers, used like iodoform, and it relieves the pain of cancerous growths which are beyond the reach of operation. Kassel uses it in laryngeal cases by means of a steam inhaler, and he affirms that it is non-poisonous and effectual. It has proved useful in sea-sickness.

Subcutine is the name given to the para-phenol-sulphonate of anæsthesine, of which a '8 per cent. solution is used under the name of Subcutol to produce local infiltration anæsthesia in minor surgical operations.

Analgen is a substance analogous to phenacetin, but derived from the chinoline group. It is introduced as an analgesic, and it is claimed for it that it has no drawbacks, but its sparing solubility and the red discoloration of the urine which it produces are objections. It is indicated in every condition in which antipyrine is used, and good results are claimed in rheumatism, neuralgia, hysteria, and asthma. The dose is 10 grs. *ter die*.

Anhalonium Lewinii is a plant of the cactus order, the tops of which are known as mescal buttons, and are used by the Mexican Indians to produce intoxication. About 4 of the buttons cause

pleasing mild delirium, with visions of beautiful kaleidoscopic colours. The pupils dilate, and the muscular power is diminished, but the organic functions are not disturbed. The blood pressure rises and the pulse is slowed owing to the powerful strengthening of the cardiac muscle. Mescal contains 4 alkaloids more or less similar in action. A fair dose will be 1 gr. of these total alkaloids, which has been found to act as an hypnotic in insomnia, but vertigo, headache, and nausea follow its use. Smaller doses may be given in fatty and dilated conditions of the heart. Tinctures made from the buttons appear to be worthless.

Anthrarobin is a yellowish-white powder produced by reducing alizarin, into which it readily changes by absorbing oxygen. Liebermann introduced it as a substitute for chrysarobin in psoriasis. It does not stain or irritate, but some authorities deny its usefulness. It is more reliable as an antiparasitic in tinea. It is applied as an ointment (1 in 8), or as a lotion 5 to 10 per cent. in alcohol.

Anthrasol is a pale yellow, oily, thick liquid obtained from coal-tar by a special refining process. It has a strong tar-like odour, but does not stain the skin, and it has proved useful in the treatment of pruritus ani in 10 per cent. solution and in a 20 per cent. ointment in chronic scaly skin diseases. It is highly suitable for baths when emulsified with caustic soda and colophone resin.

Antisepsin is Monobromphenyl-acetamide—an antifebrin compound with bromine in the form of white, tasteless crystals, which are antipyretic and analgesic, in 5-10 gr. doses. The drug does not seem to possess any advantage over antifebrin. It is not to be confounded with Antiseptin, which is a mixture of the sulphate and iodide of zinc, boric acid, and thymol.

Antiseptol (Iodosulphate of Cinchonine) is a brown insoluble powder without odour; it contains 50 per cent. of iodine, and is introduced as a substitute for iodoform on account of its cheapness and freedom from odour. Shoemaker used it in the form of an ointment (1 dr. to 1 oz.) for lupus, ulcers, etc. Internally it has been given in doses of 1 to 5 grs. in phthisis, scrofuloderma, lupus, syphilis, and psoriasis.

Antitoxins and Vaccines.—The recent researches of Sir A. Wright are steadily and materially altering the former glowing views of the profession as regards serum-therapy. Much confusion still exists concerning the fundamental differences between vaccine-therapy and serum-therapy; the subject is a large one, but only a brief consideration can here be given to it. In serum-therapy the agent employed is the serum obtained from the blood of an animal which has been vicariously injected with increasing doses of the specific bacterial toxins. These injections lead to the formation of antitoxins or protective substances in the organism of the animal which is being thus *actively immunised*, and the protective substances in the resulting serum are believed, when administered to a patient suffering from the disease, to enter into destructive chemical combination with the bacteria or their toxins, so that a state of *passive immunity* is thus obtained.

A distinction is made between the "Antitoxin" sera of diphtheria

and tetanus and the "Antisera" used in plague, pneumonia, septicæmia, etc. In the former case the serum-yielding animal is injected with the bacterial toxin, and in the latter it is vaccinated with living or dead cultures of the bacilli alone or mixed with the toxins.

Wright insists that "serum-therapy is built upon the postulate that the animal organism possesses the capacity of responding to the incorporation of practically unlimited quanta of bacterial cultures by a practically unlimited output of antibacterial substances"—a theory which is abundantly disproved in all instances, save in the case of diphtheria and tetanus. In the enumeration of the different sera mentioned in the following pages it will be necessary to remember that, save in the two exceptional cases of diphtheria and tetanus, they are examples of antisera, and are all of doubtful utility as curative agents, though some of them are valuable prophylactics.

Vaccines are defined by Wright as chemical substances derived from the bacterial protoplasm, which, when introduced into the organism, cause an elaboration of protective substances. They enter into combination with the bacterio-tropic elements already present in the organism, and thus withdraw from it a certain quantum of protective substances; this withdrawal stimulates the cells of the body to an activity which replaces "with usury" the bacterio-tropic or protective substances. It will be obvious, therefore, that in vaccine-therapy no protective substance is injected into the patient's organism, but only those bacterial substances which act as stimuli to the protective machinery. In the case of an anti-toxin serum like diphtheria, which contains large amounts of the protective substances and little or none of the toxins, the dose is practically unlimited; not so with vaccines consisting of the dead or living cultures or their toxins, intended to confer active immunity; these must be administered in carefully determined dosage. This can only be measured by accurate determinations of the opsonic index. The good results obtained by several of the antisera do not invalidate the arguments in favour of, or contradict the facts of vaccine-therapy, when it is kept in mind that the serum often contains some of the toxins or derivatives of the bacterial protoplasm originally injected into the serum-bearing animal, and these, as pointed out by Wright, function as *vaccines*. As a rule, vaccine-therapy is limited to the treatment of *localised* infections, but in the case of the *generalised* Malta fever and streptococcic infections, as in ulcerative endocarditis, good results have been achieved.

Antianthrax Serum is prepared from the serum of asses which have been immunised by injections of living and sterilised cultures of the anthrax bacillus, the sera of Sobernheim and of Sclavo being the most reliable. Extensive experiments have demonstrated the prophylactic and curative value of the serum in animals, and Wilms and others have successfully applied the treatment to malignant pustule in man. The dose of Sclavo's serum is 50 c.c., injected at three or four places in the abdominal wall at one time, or 20 c.c. may be given by the veins, and repeated hypodermically in four hours. *Vaccines* of sterilised or attenuated bacilli have been also employed, but they are unreliable when the infection is a generalised one.

Anticancer Serum.—All attempts to prepare a serum for the cure of this disease have ended in failure. Doyen, believing that *Micrococcus neoformans* was a causal organism, prepared an antiserum by using cultures of this parasite; but though some diminution in the size of the malignant growths followed the injection of the serum, no real curative results have been forthcoming.

Coley's Fluid is prepared by cultivating the erysipelatous *Streptococcus* and *Bacillus prodigiosus* in bouillon, and sterilising for 1 hour at 58° C. $\frac{1}{2}$ to 1 min. should be injected into the tissues, close to the tumour, and the dose cautiously increased according to the reaction obtained. Sarcomata have sometimes been found to disappear under this treatment, as they have been known to vanish after an attack of erysipelas.

Anticatarrrhal Vaccines, after Wright's methods, have been successfully employed for the treatment of catarrhal inflammations affecting the upper portions of the respiratory tract. The specific organism having been isolated from the mucous discharge, cultures are made and injected. The following initial doses, according to Allen, may be administered in acute attacks: Of the bacillus of Friedländer (the usual causal organism of nasal catarrh), 50 to 75 million; and the same dosage applies also to *Bacillus septus*, *Micrococcus paratetragenus* and *catarrhalis*; of the influenzal bacillus the dose is 10 to 25 million, and of the pneumococcus double this latter number. The Wimpole Institute supplies Allen's polyvalent, or "combined vaccine for colds," in tubes containing the requisite dose of each organism, and the vaccine of Friedländer's bacillus containing 125 to 500 million organisms. Not only are acute attacks speedily aborted, but the victims of repeated seizures may be rendered immune by a dose administered every 4 to 6 months. In chronic nasal catarrh injections of Friedländer's bacillus (500 million of organisms) must be continued for several months in conjunction with antiseptic douches.

Anticerebro-spinal Fever Serum, or Antimeningococcic Serum.—Several sera are procurable for the treatment of this disease—viz., those of Jochmann, Kolle and Wassermann, Ruppel, Flexner, etc. There can be little doubt of the marked curative power of Flexner's preparation. This serum he obtains by immunising a horse with gradually increasing doses of living cultures of the meningococcus for almost one year. Robb, towards the end of the Belfast epidemic of cerebro-spinal fever when this serum first became procurable was able to reduce the mortality from about 75 per cent. to 30 per cent. The dose is 30 c.c. injected by lumbar puncture at the earliest possible opportunity; some of the most apparently hopeless cases made a rapid recovery.

Owing to the generalised nature of the infection, vaccine-therapy holds out little prospect of success in this disease.

Anticholera Serum has proved disappointing, being only feebly antibacterial and not antitoxic, and owing to the short duration of the disease there is not time for its action. Macfadyen's serum is prepared by immunising goats. Haffkine's prophylactic vaccine is of undoubted value, its use in India having demonstrated that it affords a fairly safe immunity for about one year. Those few who caught the disease within a period of 14 months after inoculation

had a mortality of only one-fifth of the rate of death amongst the victims who had not received the vaccine.

The preparation is made from fresh *living* cultures of the cholera spirillum, intensified by growing them in the peritoneal cavity of guinea-pigs. 1 c.c. of a weak vaccine is injected hypodermically, and this is followed in 4 days by 1 c.c. of the stronger preparation. Kolle's vaccine has the one advantage of not being necessarily prepared fresh; it consists of a 1 c.c. dose, repeated in 10 days, of a standardised emulsion of the *sterilised* organisms preserved with $\frac{1}{2}$ per cent. phenol.

Anticolon-Bacillus Serum is a polyvalent antibacterial and feebly antitoxic serum, prepared from the blood of horses which have been immunised by injections of cultures of various strains of the *Bacillus coli* obtained originally from cases of puerperal fever and septic peritonitis. It is injected in 15 c.c. doses.

Vaccine for Bacillus coli infections.—The results of the serum in *Bacillus coli* infections are not so satisfactory as when the vaccine method is resorted to, as in this case the particular strain may be procured from the patient's urine, blood, or tissues, and cultures made from it; and the opsonic determination proving satisfactory, 100 million of the organisms may be injected. The writer has seen most marked success follow the use of this vaccine in his wards, under the guidance of Dr. T. Houston, who prepared cultures from the specific bacillus invading the patient's organs. In *Bacillus coli* cystitis and pyelitis, gall-bladder suppuration, and the many post-operative suppurations of the abdomen this treatment is most valuable. Sir A. Wright—the great immunisator—looks forward to it as the future ideal treatment of gall-stone. Metchnikoff recommends the administration of lactic acid bacilli with the view of preventing the multiplication of the coli bacillus in the intestinal tract. (See under Koumiss.)

Antidiphtheria Serum (Diphtheria Antitoxin).—As a remedial agent, both prophylactic and curative, this serum stands upon a much firmer basis than all the other sera. It is prepared by actively immunising the horse with increasing doses of the filtered bacterial toxins of the Klebs-Loeffler bacillus for several months. The animal's blood becomes gradually charged with an antitoxic substance which is contained in the serum after venesection. The potency of this serum is accurately determined by measurement of its effects upon guinea-pigs, the Ehrlich unit being the amount of serum capable of neutralising 100 lethal doses of toxin when injected into a medium-sized guinea-pig. (Behring was able to prepare a serum from the blood of a guinea-pig of such marvellous potency that the one-thousandth part of a single minim destroyed a lethal dose of the toxin.) The quantity of serum is not taken into account in the dosage; each specimen varies in strength, and the dose is calculated independent of volume, being for ordinary cases, regardless of age, when seen in the early stage, 5,000 units, repeated in 24 hours, double this amount being necessary in severe or late cases. In severe and apparently hopeless late cases 25,000 units have been given with complete success, followed by smaller doses every 4 or 6 hours afterwards. The prophylactic dose should be 500 to 1,000 units, and the immunity lasts for about 3 weeks.

A dry serum is prepared, 1 grm. of which should contain 5,000 immunising units. By serum-therapy it is claimed that the mortality all round has been reduced by at least 50 per cent., and this certainly underestimates the saving of life when the remedy is resorted to early, since cases treated by the serum on the first day of the disease show a mortality of less than 1 per cent. Laryngeal cases always require full doses, the minimum being 10,000 units.

Antidysentery Serum has been prepared from the serum of horses immunised by injections of the toxins and Shiga-Kruse bacillus of dysentery. The dose of the serum prepared at the Lister Institute is 20 c.c., given hypodermically, and repeated in double this amount, if necessary. Todd's serum has more powerful antitoxic properties. Wright's *vaccine* method has also been employed successfully in this disease.

Antiglanders Vaccine, under the name of Mallein, is prepared by sterilising broth cultures of the glanders bacillus, and concentrating the liquid. This is used only as an agent for diagnosing the disease in horses in doses of 1 c.c. injected hypodermically into the tissues of the neck, a marked reaction following inside 20 hours when glanders is present. Dried mallein is also obtainable.

Wright, in his "Studies on Immunisation," p. 409, details a case of glanders in a girl successfully treated by a vaccine of the glanders bacillus isolated from the patient's abscess.

Antigonorrhœa Serum has been prepared from the blood of horses immunised by frequently repeated injections of various strains of streptococci intensified by their passage through a succession of animals. The resulting polyvalent antistreptococcic serum has been hypodermically injected in doses of 50 c.c. in gonorrhœal rheumatism with success, and has been also found useful in some cases of chronic gonorrhœa. It is, however, inferior in its results when compared with the following :

Antigonococcal vaccine is prepared from cultures of the gonococcus obtained from acute untreated cases of gonorrhœal urethritis. The initial dose of the vaccine should contain 100 million cocci, and the hypodermic injections should only be commenced after a careful determination of the opsonic index. When the negative phase is a prolonged one the injections should be suspended for at least a fortnight. With a low opsonic index an initial dose of 300 million cocci may be given, and this can be increased to 1,000 million. Excellent results have been obtained from this treatment, not only in ordinary gonorrhœa, but in gleet, gonorrhœal rheumatism, and pelvic complications.

Anti-Hay Fever Serum is the incongruous name given to the preparation introduced by Dunbar. It is prepared from the blood of horses injected with a toxic proteid body obtained from the pollen of various grasses, and is supplied under the name of Pollantin. Unlike all the other sera, this antitoxic preparation must not be given hypodermically, but applied locally to the mucous membrane of the eyes and nose. A few drops instilled into the eye, and the dried and powdered serum used as a snuff, give most marked and speedy relief to all the local symptoms in hay fever by neutralising the toxins which locally cause the irritation.

Antileprosy Serum.—All attempts to obtain a serum for the treatment of this disease have proved unsatisfactory. Carrasquilla's method of preparing an antitoxic serum from horses which had been injected with the serum obtained from lepers is useless. The following preparation has been wrongly described as a serum, being really a toxin or vaccine :

Leprolin is the toxin prepared from cultures of the bacillus of leprosy after the manner of tuberculins, and Rost reported favourably of its good effects ; but recent reports prove its failure. More recently Deycke has introduced as a leprosy remedy a fatty substance under the name of Nastin, which he extracts from the specific organism after growing it in milk. He injects every week 8 to 15 mins. of a 1 per cent. solution in olive oil.

Anti-Malta Fever Serum.—This serum is practically useless, and, as pointed out by Wright, if it be prepared from an animal's blood during the negative phase, it will prove toxic and dangerous. Though vaccine-therapy is, as a rule, not applicable to generalised infections, nevertheless, benefit has been obtained by the following :

Anti-Malta fever *vaccine*, as prepared by Wright and his pupils after testing the agglutination reaction and the opsonic index, has given good results. (The sterilisation of the milk of the goats has already banished the disease from the military garrison on the Island of Malta.)

Antiplague Serum.—Yersin's plague serum is prepared by injecting horses intravenously with virulent cultures of the plague bacillus. This, it will be observed, differs from the antitoxic serum of diphtheria obtained by injections of the toxins of diphtheria, and similar satisfactory results cannot be expected from it. The dose of the Lister Institute serum prepared by Yersin's method is 20 to 40 c.c., but doses much beyond these amounts (viz., 50 to 150 c.c.) must be resorted to if the patient has already developed the symptoms of the disease, though half of the smaller dose appears to confer immunity by acting as a prophylactic to healthy subjects during an epidemic.

Antiplague *vaccines* give unquestionably better results. Haffkine's Prophylactic, as supplied by the Lister Institute, consists, like the vaccine of Lustig, of dead cultures with their toxins, of the plague bacillus. 3 c.c. is the usual adult dose administered hypodermically, and the immunity conferred by this lasts usually for three or four months ; but should the individual chance to catch the disease during this period or soon after, the attack is almost certain to be a mild one.

Klein's Prophylactic is inferior to Haffkine's ; it was made from the organs of rodents killed by the plague bacillus, and is not now employed.

Antipneumococcic Serum.—The sera hitherto prepared by injecting horses with virulent cultures of the pneumococcus have failed in the treatment of pneumonia, but the new serum prepared by Merck promises better results. It is, moreover, tested like the diphtheria antitoxin by Römer, and is made to contain 20 to 40 immunising units in 1 c.c. It cannot, however, be considered as antitoxic in the sense of the antidiphtheritic serum, but it appears to possess marked antibacterial properties. The dose in the early

stages of pneumonia is 400 units, and half this amount is used as a prophylactic.

Pneumonia being due to different strains of the pneumococcus, polyvalent sera are obtainable, and many recommend the simultaneous use of antistreptococcic serum. Merck's serum has proved of great value in corneal ulceration, injected hypodermically and instilled into the eye. From the reports of the action of this serum in pneumonia by Krische, it appears to the writer that it probably in some cases functions as a *vaccine*, since increase of fever and aggravation of the symptoms sometimes follow its use before the benefits appear. Antipneumococcic *vaccines* are also obtainable with a dosage of 100 to 500 million of the organisms, and these have proved useful in empyema. It is noteworthy that Römer combines both the serum and vaccine methods, and Reis advocates that both methods should be used in cases of severe corneal ulceration.

Antistaphylococcic Vaccine.—Hitherto the preparation of a serum of any value has proved impossible, but excellent results have been obtained by a vaccine prepared by Wright's method, and the writer has witnessed very remarkable success follow this plan of treating staphylococcal infections at the hands of Houston in furunculosis and abscess and ulcerations. It has given excellent results in inveterate acne and sycosis, and Wright believes that it will prove invaluable in the treatment of compound fractures, and as a prophylactic in cases of jaw and tongue operations where the wound cannot be kept aseptic.

The organism being isolated from the abscess, it is cultivated on agar, and the dosage is from 100 to 500 million of the killed staphylococci.

Antistreptococcic Serum has been reported upon favourably in erysipelas, surgical and puerperal septicæmia, pyæmia, scarlatina, etc. Its action is not antitoxic, but bactericidal, and the results are not to be compared with those obtained by the antidiphtheritic serum, which is a true antidote to the toxin producing the symptoms. An inherent difficulty lies in the fact that different streptococci may be at work in producing the diseases mentioned, and it has been demonstrated that the serum prepared from one variety will not protect against a different streptococcus. This is the probable explanation of how in one case the remedy will save life, whilst in the next it will be useless.

A polyvalent serum is obtained from the serum of the horse after the animal has been immunised by repeated injections of a variety of strains of living streptococci. 30 c.c. should be given immediately, and half this amount every 12 hours till the improvement manifests itself.

Menzer, believing that articular rheumatism is always the result of a streptococcus infection, treats his cases with a serum prepared by immunising animals with streptococci obtained from the tonsils in rheumatic cases. This serum has already proved efficacious in some apparently hopeless chronic cases of articular rheumatism, in puerperal infections, phlegmons, septic diphtheria, and erysipelas. It is contra-indicated in ulcerative endocarditis.

The *vaccine* method of treating erysipelas, septicæmia, carbuncles, endocarditis, abscesses, puerperal fever, boils, empyema, etc., is to

be distinguished from the use of the above serum. The vaccine or inoculating material is prepared by making cultures of the particular strain of streptococcus obtained from the patient, after which a dose of from 10 to 50 million of the sterilised organisms are injected. Septic endocarditis has been successfully treated in this manner, the strain of the coccus being obtained directly, in the first instance, from the blood of the patient. Scarletina has been treated by a vaccine prepared from the cultures of the streptococcus causing the disease, as well as by a serum prepared by immunising the horse with these organisms.

Antitetanus Serum (Tetanus Antitoxin).—Though experimental evidence proves the wonderful efficacy of this agent, in practice the results are disappointing, owing to the fact that the microbe has been manufacturing and discharging its virulent poison into the system for a long time before the symptoms give any warning of the disease, and then it is either too late to administer the drug, or it will require enormous amounts of the serum to be of any use; nevertheless, the patient should always, when possible, get the benefit of a trial of large doses. The serum is prepared in a similar manner to the antidiphtheritic preparation. Of the Jenner Institute serum the dose is 10 to 20 c.c. Hewlett states that the serum should have the power of 1 million Roux units—*i.e.*, that 1 c.c. of it should protect 1 million grms. of guinea-pig from the minimum lethal dose of the tetanus toxin. Behring's dry serum is given in doses of 80 grs., and Tizzoni's in doses of 40 grs.

There is little good to be expected from small doses, and the results are more hopeful in those cases where the symptoms do not come on abruptly. 20 to 30 c.c. should be injected hypodermically at the earliest possible moment, and 10 c.c. every 6 or 8 hours afterwards; 100 c.c. have often been administered without harm. In severe cases the serum must be administered by slowly injecting it deeply into the brain substance after drilling a hole in the cranium over the centre of the motor area under rigid aseptic conditions; or the serum may be injected into the cerebro-spinal cavity by lumbar puncture. Local treatment, as excision of the wounded area, when possible, should be resorted to. Dry serum has been used as a dressing to the wound, especially when this has been contaminated with earth, and the liquid serum has been successfully injected into the nerves in the region of the site of the original inoculation. Prophylactic treatment, by injecting a small dose after the receiving of wounds contaminated by clay, soil, or dust, would probably be certain. The serum is not antibacterial, as the tetanus bacillus will flourish in it, and the same is true of the antidiphtheritic serum.

Antithyroid Serum (Antithyroidin-Moebius).—This serum differs entirely from all the other sera, both in its action and method of preparation, being the serum of animals whose thyroid glands have been removed six or eight weeks before being bled. The blood and the milk of the thyroidectomised animals are believed to contain antitoxins, which neutralise the toxins produced by the overaction of the human thyroid in exophthalmic goitre.

8 mins. constitute a safe dosage, and can be given by the mouth; Merck prepares tablets each representing 8 mins. of the serum.

For two days one of these should be given three times a day ; upon the third and fourth days two should be given three times ; on the fifth and sixth two should be given four times ; on the seventh and eighth, two tablets five times a day. An interval of two days is permitted, and from the eleventh day the dosage is reduced in a corresponding manner. 54 tablets, or 25 c.c., according to this method, should have been ingested by the end of the eighth day. Double the above quantities have been given without harm. Some recommend 1 c.c. to be injected hypodermically every second day. The after-dosage must be modified according to the symptoms, and as symptoms of exophthalmic goitre have been observed after large doses of thyroid substance, so myxœdematous signs have been noticed after prolonged dosage with this serum.

The serum has proved very valuable, not only in Graves' disease, but in some cases of diabetes and of osteomalacia.

Thyroidectin—a brownish-red powder—is the dried blood of thyroidectomised animals, supplied in 5 gr. capsules.

Rodagen—a white powder—is the desiccated milk of thyroidectomised animals, diluted with half its own weight of lactose, of which 2 to 4 drs. may be given daily.

Antituberculosis Serum, introduced by Maragliano, was prepared from the blood of horses injected with toxins of the tubercle bacillus, and Marmorek's serum, prepared after a similar process, is still advocated. There can be little doubt that the contention of Wright is correct, that all sera prepared on the above principle, except in the case of diphtheria and tetanus, are not to be relied upon. The fact that sometimes good results often follow the hypodermic and rectal injections of 5 c.c. to 10 c.c. of Marmorek's antituberculosis serum are due, upon Wright's hypothesis, to an *active* immunisation caused by bacterial elements derived from the original injections administered to the horse rather than to any protective (passive immunisation) substances elaborated by the animal. If this be the case, the good results must be regarded as the effect of the *vaccine* method as will be mentioned in the explanation of the action of the so-called antityphoid serum of Chantemesse.

Vaccines for Tuberculosis.

Koch's Original Tuberculin (Tuberculin Old) is an amber-coloured liquid prepared by boiling, concentrating and filtering glycerin extracts of tubercle bacillus cultures of the age of three months. The initial dose of this for diagnostic purposes is the one-thousandth part of 1 c.c. for a strong adult ; if no reaction occurs, 5 times the above dose may be given, and another injection of the one-hundredth part of 1 c.c. ('01 c.c.) should this still be negative.

For curative treatment the Old tuberculin is now seldom employed ; when it is selected the initial dose should not exceed '001 c.c., and it may be cautiously increased after all signs of reaction have disappeared, double the dose being given every two or three days until '005 is reached. The following preparation is preferable:

Tuberculin T.R. (New Tuberculin) is a suspension of Koch's tubercle powder, made by triturating tubercle bacilli and extracting with water ; each c.c. of the opalescent liquid should contain 2 milli-

grammes (and not 10, as formerly stated by mistake) of the powder. Wright's method of using the above in all cases of localised tuberculosis is to sterilise the liquid by heating it for one hour at 60° C., afterwards diluting it with salt solution containing '25 per cent. lysol. Of this liquid an initial dose corresponding to $\frac{1}{50000}$ milligramme of the dried substance (actual percentage) is regarded as the maximum. Some immunisators commence with much larger doses. The chief point in the vaccine treatment is the determination of the opsonic index after each injection at first, the aim being to maintain as high a level of immunity as possible, and not to give a new injection till the opsonic power as shown in the positive phase commences to recede; this is much better than to give the next injection at the height of the positive phase. Generally speaking, the injections will be required to be repeated about every tenth day. The increase of dosage and the duration of treatment can only be determined by the response as calculated from the opsonic curve.

Human, bovine, and mixtures of these bacilli have been used in the preparation of Tuberculin T.R. That from the bovine type of bacillus is known as Tuberculin P.T.R., or Perlsucht Tuberculin Residuum, the minimum initial dose of the liquid being '00001 c.c. This is recommended in the abdominal tuberculosis of childhood upon the erroneous belief or theory of an essential or specific difference between the bovine and human types—a question which has been elaborately dealt with in the author's Cavendish Lecture (see *Lancet*, July, 1908).

Calmette's tuberculin solution for ophthalmic reaction is prepared free from glycerin by precipitation with alcohol and re-solution in distilled water. A drop of the '5 per cent. liquid is instilled into the conjunctival sac, and after 6 to 12 hours a distinct reaction (tuberculin conjunctivitis) will be obvious when the subject is tuberculous. Von Pirquet achieves similar diagnostic results by making two minute and superficial cutaneous scarifications after placing 2 drops of Koch's original tuberculin diluted on the skin; if the subject be tuberculous, a small reddish papule will appear within 24 hours.

Tuberculin Ointment (Moro's) consists of 5 c.c. Koch's "old" tuberculin, incorporated with 5 grammes of anhydrous wool-fat. About the size of a pea of this is rubbed into the unbroken skin, over an area of 3 or 4 square inches; after 24 to 48 hours small red papules appear in this area if tuberculosis be present.

Antityphoid Serum.—This agent, as regards experimental value, is in a different position from the antidipteria serum remedy, and reports of the use of the serum are still most contradictory and disappointing. The antityphoid serum acts by its *bactericidal* and not by *antitoxic* properties. About 3 drs. of the serum may be given daily.

Antityphoid Vaccine.—Wright has pointed out that the serum of Chantemesse, which is administered in 5 min. doses, contains a *toxin*, and is in reality a *vaccine* in disguise. The difference between the new *vaccine* or *inoculation* methods practised by Wright and the *antitoxic sera* method is obvious. Thus, for the preventive treatment of typhoid fever Wright injects a dose of 1,000 million of the specific bacilli of typhoid fever after these have been sterilised by heat, followed in 14 days by an injection of twice this number.

Macfadyen's Antiendotoxin is prepared by injecting the bacilli (after trituration of them at a temperature of liquid air) into the veins of goats. Chantemesse has demonstrated that the instillation of typhoid toxin gives a distinct ophthalmo-reaction of great value in the diagnosis of this fever : tubes can now be obtained for this purpose.

Antivenene is a serum prepared by immunising an animal with rapidly increasing doses of snake venom. Most striking results have been demonstrated by Calmette and Fraser in their experiments. The remedy has been successfully used for cobra bites in the human subject, when used early in doses of 300 c.c. The serum contains a potent antitoxin, and is therefore to be regarded in a sense as on a par with the diphtheria and tetanus antitoxins, and differs essentially from the bactericidal sera used in the treatment of the other septic infections. It is specific only for the bite of the same genus of serpent from which the immunising toxin was originally obtained ; and as this is at present only procurable from the cobra, the antitoxin is limited to bites by this serpent. The original dosage (20 c.c.) was found to be useless.

Apiol.—A green oily liquid, the active principle of the fruit of parsley (*Apium petroselinum*). It is a powerful diuretic ; in large doses it produces effects like quinine, ringing in the ears, headache, and vertigo. It is recommended in dysmenorrhœa and amenorrhœa, given immediately before the expected menstrual period, in capsules containing 3 to 5 mins. Apiol camphor (crystallised apiol) is given in doses of 5 grs. Apiole is a yellow fluid obtained by saponifying apiol. It is recommended in 2 min. doses in capsules in all menstrual disorders in which apiol is given.

Ergoapiol is the name given to a combination of ergot and apiol administered in capsule form for amenorrhœa.

Apocodeine, formed from codeine (as apomorphine is from morphia), was vaunted as an expectorant, but its action is doubtful, and it is liable to cause vomiting. It has been found in 30 min. doses of a 1 per cent. solution of the hydrochloride when injected subcutaneously or deeply into the buttock to produce increased peristalsis of the bowel, leading to several soft evacuations.

Apocynum Cannabinum.—The dried rhizome of American Indian hemp or Canadian hemp exerts a slowing action upon the heart like digitalis, and is a reliable diuretic. It resembles strophanthus more than digitalis, as it has no effect upon the arterioles, but it is a powerful irritant to stomach and bowels. It has been used in mitral disease, pleurisy, and uræmia. It is given with advantage in dropsies of cardiac and renal origin, and its power over effusions is said to be so great that it has been called in America the "Vegetable Trocar." Dose—Of a tincture (1 in 10) 20 to 60 mins., or of the liquid extract 10 mins., or of the eclectic principle—Apocynin—as an expectorant $\frac{1}{4}$ to $\frac{1}{2}$ gr. If given in fuller doses it is a hydragogue cathartic.

Arbutin is a glucoside of *Uva Ursi*. It is split up in the system—hydrochinon appearing in the urine, which becomes brown or olive-green on exposure. It is not poisonous ; the hydrochinon into which it decomposes is a powerful antiseptic, even in 1 per cent.

solutions. It is beneficial in chronic cystitis and vesical catarrh arising from obstruction, etc., and in suppurative conditions of any part of the urinary tract. It may be given in the form of powder in 15 gr. doses, in water.

Cellotropine is the benzoic ether of arbutin, and has been given in doses of 60 mins. in tuberculosis.

Arecolinæ Hydrobromas is the salt of an alkaloid obtained from areca nut. It is introduced as a substitute for eserine, and has powerful sialagogue action, and is an anthelmintic resembling pelletierine. 1 per cent. solution causes contraction of the pupil in 10 minutes, which passes away in about an hour. It has given excellent results in glaucoma where eserine has failed. It is a powerful poison, acting like muscarine when swallowed.

Tenaline is a liquid preparation of areca; it is a powerful anthelmintic, less toxic than arecoline, and is chiefly used in veterinary practice.

Argentamin is a solution of phosphate of silver in ethylenediamine and water, corresponding in amount of silver present to a 1 in 10 solution of lunar caustic. It is powerfully antiseptic, and, though more efficacious than the nitrate because it penetrates deeper into the tissues, it produces less irritation owing to its alkaline reaction. It does not form deposits or discolorations upon the diseased cornea, and has been found (in 5 per cent. solutions) more satisfactory in eye work than the ordinary lunar caustic. In gonorrhœa it is much praised, injections of 1 in 2,000 to 4,000 speedily destroying the parasite.

Argentol is Quinaseptolate of silver—a yellow, sparingly soluble powder, which readily splits up into oxyquinoline and metallic silver. It is used as a dusting powder, like iodoform, and it is also hæmostatic when so employed, and as an injection (1 in 1,000) in gonorrhœa. Recently it is recommended as an intestinal antiseptic in doses as large as 5 grs.

Silver Trinitrophenol, or Picratol, is used as a remedy in gonorrhœa in the form of gelatin bougies or vaginal suppositories. Like argentol, its 30 per cent. of silver is set free on contact with organic matter.

Argentum Colloidale (Collargol) is another of Credé's silver preparations. It is metallic silver in a colloid state and in the form of Credé's ointment (15 per cent.) it is rubbed into the skin in syphilis. The drug is also given internally as an intestinal and gastric disinfectant, in doses of 1 to 2 grs. in pill, and subcutaneously and intravenously in leprosy; it has been observed to increase markedly the growth of the hair, and is used as a 1 to 5 per cent. albuminous solution in conjunctivitis and cystitis. Electrargol is the name given to a weak French solution prepared by electrolysis. A new colloidal silver preparation, known as Lysargin, has been introduced by Weissmann for intravenous injection in 5 c.c. doses of a 10 per cent. solution in acute septic conditions, pneumonia, etc.

Argonin is a compound of silver with casein which possesses many of the properties of the preceding drug. It has been used successfully in 5 per cent. solution in gonorrhœa. It causes little irritation,

and is powerfully antiseptic like Actol (which see). A soluble form—Argonin L.—is used in 1 per cent. solution for gonorrhœa in the early stages.

Argyrol (Vitellin) is silver in combination with a wheat proteid, and contains 30 per cent. silver. It forms a black solution in water. 5 per cent. strength has proved valuable in gonorrhœa, but the drug is chiefly used in ophthalmic practice, instillations of 25 per cent. being painless, and most reliable in gonorrhœal ophthalmia and ophthalmia neonatorum, and acute conjunctivitis. It is used also as a 2 per cent. ointment to the lids, and has been successfully injected in 1 per cent. solution in ulcerative colitis and dysentery. In its action it resembles Protargol, Largin, Albargin, Ichthargan, Itrol, and Tachiol (which see). Freshly precipitated (nascent) Iodide of Silver in 3 per cent. suspension has been used in ophthalmia and gonorrhœa.

Aristol (Di-Thymol-Iodide) is a brown, insoluble, unstable powder, prepared by the action of thymol upon iodides; it contains about 46 per cent. iodine. It is introduced as a substitute for iodoform in every diseased condition in which iodoform has been used. In lupus it has given excellent results, but has no action upon the unbroken skin, and therefore does not affect lupus which is not already freely ulcerating. It may be dusted as a powder over the ulcers or applied as a 10 per cent. ointment or oil, and it has been applied to corneal ulcers.

In scrofuloderma, epithelioma, and all late syphilitic ulcers, it has been found efficacious, but the drug has not gained in favour, though reports of its value were published in tinea, gonorrhœa, chancres, psoriasis, eczema, ozæna, otorrhœa, rhinitis, etc. In vaginal and uterine ulcerations it may be used as a pessary. In psoriasis the best plan is to apply a 10 per cent. solution in flexible collodion, or a 10 per cent. starch paste, or a plaster (20 per cent.). For chancres and ulcers of the legs a good plan is to sprinkle them with a mixture of equal parts of aristol and oxide of zinc.

The iodides of diiodophenol, diiodoresorcin, diiodosalicylic acid and of cresol are also brown powders which are being used as antiseptics. (See also Sanoform and Sozoiodol.)

Arrhenal, or Arsinyll (Disodium Methyl Arsenate) is an almost tasteless, odourless compound of arsenic, introduced by Gautier, under the name of the "New Cacodyle," as a substitute for the cacodylate of soda in tuberculosis, cirrhosis of liver, sleeping sickness, malaria, syphilis, etc. It does not cause the garlic odour from the breath, and does not upset digestion when given by the mouth in doses of $\frac{1}{4}$ to $\frac{3}{4}$ gr. for 7 days continuously, and then stopped for a similar period. The Basic Arrhenalate of Quinine is similarly used, and the allied salt—Mercury-Salicyll-Arsenate, under the name of Enesol, has been introduced as a painless hypodermic method of treating syphilis in $\frac{1}{2}$ to 1 gr. daily doses, and though vaunted as being harmless, its use is by no means free from danger.

Arsamin, or Atoxyl, is Sodium Para-amino-phenyl-arsinate, introduced as an antisyphilitic. The drug is given *hypodermically* in doses of 1 to 3 grs., increased to 15 grs., and many observers report most favourably of it; but an investigation of the extensive literature

of the subject must convince the most sceptical that it is a drug of dangerous toxic power. The writer saw one case of incurable blindness and peripheral neuritis caused by it, and many observers including Koch, testify to the blindness which it sometimes produces. There are no benefits arising from its use which cannot be obtained from mercurials with absolute safety. Koch lauds it as a remedy for sleeping sickness, and here its dangerous qualities are not exactly on the same footing as in syphilis, since we have no specific drug for the treatment of trypanosomiasis. The best results are obtained in sleeping sickness by alternating the atoxyl treatment with mercurials. It has been extolled also in malaria, but without evidence of any superiority over the harmless quinine specific. The writer has little doubt but the drug will pass into complete disuse.

Acetyl-para-amino-phenyl-arsinate (Acetyl-Atoxyl or Tylarsin) is given in similar doses as atoxyl, and appears to possess marked power over trypanosomiasis, and is said to be somewhat less toxic; but only time will establish its freedom from serious danger to the optic and peripheral nerves. Soamin is the name given to Burroughs Wellcome's para-amino-phenyl-arsonate, and it is claimed to be non-toxic; but only further experience can demonstrate this.

Aseptol is a 33 per cent solution of Sulphocarbollic or Sozolic Acid (principally the *para*-acid), and is a syrupy liquid with a faint carbollic odour. It resembles in its properties both salicylic and carbollic acids. It differs from the former in being very soluble, and from the latter in being less caustic, and in being perfectly harmless. It has been consequently used in abdominal surgery in 5 per cent. solution, and in half this strength as a mouth-wash and gargle. It is a delicate test for albumin and bile pigment in the urine. The copper salt, known as Copper Aseptol, is a valuable astringent and hæmostatic. The zinc and soda salts are official.

Oxychinaseptol or Diaphtherin and Chinaseptol or Diaphthol are allied antiseptic and unirritating crystalline bodies. The former is used in 1 to 2 per cent. solution for burns, wounds, otorrhoea, etc. It is especially valuable for washing out cavities, but it blackens nickel and silver instruments. (See also under Chinosol or Quinosol.)

Aspidospermine, an alkaloid of Quebracho Bark, has been used in cardiac asthma and emphysema in $\frac{1}{2}$ to 1 gr. doses. It is a powerful drug, and must be used with caution. Large doses have a marked antipyretic action. Hydrochloride of Quebrachine has been given hypodermically and by mouth, in doses of 1 gr. It acts as an emetic, like apomorphine, speedily and energetically.

Aspirin, known also as Acetyl-Salicylic Acid, Acetysal, Salacetin, and Saletin, is a white, almost insoluble, powder obtained from salicylic acid. It was introduced as a substitute for the salicylates, and possesses the advantage over them in its slower and more continuous action, owing, possibly, to its slower absorption, the drug passing through the stomach unchanged till decomposed by the alkaline secretions of the small intestine. It is given in all cases where the salicylates are indicated, as in acute and chronic muscular and arthritic rheumatism. It has marked analgesic properties, and often relieves severe neuralgia, sciatica, and other painful

conditions. It has proved useful in acute pleurisy, chorea, diabetes, and as an intestinal disinfectant in many conditions of the bowel. The dose is 10 to 15 grs. in cachets ; usually given in tablets, which, if swallowed whole, are liable to remain undissolved.

Novaspirin is a white powder of allied composition, being the methyl-citric-acid ester of salicylic acid. It is given in similar or somewhat larger doses, and is said to less frequently interfere with the appetite and digestion.

Aspirophen possesses similar action ; it is also a white crystalline, almost insoluble powder, being amido-acet-paraphenetidin acetyl salicylate allied to phenacetin. It is given in 15 gr. doses, and is markedly analgesic.

Diaspirin is the succinic ester of salicylic acid, described under its own name.

Auri et Sodii Chloridum is an orange-yellow deliquescent powder. Small doses ($\frac{1}{2}$ gr.) increase the appetite and promote constructive metamorphosis ; larger doses increase waste—the tissue yielding most readily being the connective, especially that of pathological formation—hence its use in sclerosis ; and Bartholow affirmed that it cured posterior spinal sclerosis and interstitial nephritis. It has been given in hystero-epilepsy, melancholia, sexual debility, nerve diseases characterised by spasm, as laryngismus, asthma, chorea, in cirrhosis of the liver and lung, amenorrhœa, etc., and in various ovarian and uterine affections. In tertiary syphilis it seems to act like the chloride of mercury. In concentrated form it acts as a caustic. Dose— $\frac{1}{6}$ to $\frac{1}{4}$ gr., in pill.

Wood reports most favourably of gold with bromide of arsenic in the neurotic diseases of old age. The bromide of gold is recommended in epilepsy and hystero-epilepsy in doses of $\frac{1}{16}$ gr. in water, and in the treatment of chronic alcoholism.

Baptisin is the extract from the root of the wild indigo, which is one of the eclectic remedies. In the form of powder—1 to 5 grs. in pill—it causes purging, with gastric disturbances. In smaller doses it has been employed as a laxative in chronic constipation.

Barium.—All barium salts are highly poisonous, causing death by paralysing the heart. In small doses ($\frac{1}{2}$ gr. of the chloride) the drug strengthens the muscular power of the heart, slows the pulse, and raises the blood pressure, and causes marked contraction of the involuntary muscular tissue, especially of the intestines. Owing to the toxic power of all the barium salts they are seldom employed ; they have been administered in mitral disease. The spa at Llan-gammarch in Wales contains $\frac{3}{4}$ gr. of the chloride in each pint.

Bay Rum (Spiritus Myrciæ) is official in the U.S.P. It is made from the volatile oil distilled from the leaves of *Myrcia* or *Pimento acris*—oil of myrcia '8, oil of orange peel and of pimento of each '05, alcohol (95 per cent.) 61, and water to 100. It is a popular remedy for dandruff.

Benzoline, known as Petroleum Benzine, P. Benzene, P. Ether, or P. Spirit, is a colourless inflammable liquid, obtained from petroleum, and not to be confused with the official Benzol or Benzene prepared from coal-tar oil. It is introduced into the B.P. Appendix as a solvent, and is used for heating cauteries ; under the name of

Petrol (S.G. .7, boiling-point 75° C.) it is used as motor spirit. Its only therapeutic use is as a cleanser of the skin in seborrhœa and acne. Amyl or Pentyl Hydride is obtained from it. (See under Rhigolene.)

Benzonaphthol (Beta-Naphthol Benzoate or Benzoyl-Naphthol) is a colourless, tasteless, and almost odourless crystalline powder, obtained by acting on benzoyl chloride by beta-naphthol. It is used as an antiseptic, and when given internally it acts like most of the naphthol compounds as a disinfectant to the intestinal tract, the naphthol exerting its local action, whilst the benzoic acid is excreted as hippuric and acts as a diuretic. It has been used in typhoid fever and infant cholera, in doses of 6 grs., in wafer paper, to be given every 3 or 4 hours. It is successful in pruritus senilis as a 10 per cent. ointment.

Lactol is identical in action, but more soluble. It is the lactate of beta-naphthol.

Benzosalin (Methyl-benzoyl-salicylate) is a white crystalline powder, insoluble in water, which acts like aspirin, remaining unchanged till it meets the alkaline secretions of the small intestine. It is given in cachets or tablets in doses of 10 to 15 grs. in rheumatism and intestinal sepsis.

Benzosol (Guaiacol Benzoate) is a white crystalline insoluble powder, almost without odour, being the benzoyl ester of guaiacol (which see). It contains over 50 per cent. guaiacol, which is supposed to be set free in the intestines. It has been introduced as a palatable form in which to administer guaiacol in phthisis and abdominal tuberculosis, in which disease it has been given in 8 gr. doses 4 or 6 times a day, with marked benefit, mixed in sugar or chocolate. It does not appear to possess any advantage over guaiacol, save in being less nauseous.

Benzoyl-Acetyl-Peroxide resembles benzoyl peroxide, acting like hydrogen peroxide, oxidising all organic substances. It is used as a disinfectant to wounds (10 grs. to 1 pint water), and has been given internally in typhoid fever and dysentery. Acetozone is the name given to a mixture of this substance with its own weight of infusorial earth, which is used as a disinfectant.

Benzoyl Peroxide exists in white crystalline prisms, prepared by the action of peroxide of sodium on benzoyl chloride. It is very sparingly soluble in water, but acts as a powerful disinfectant for wounds and burns in a 3 per cent. oil or 5 per cent. ointment.

Benzoyl-Salicin, known as Populin, is obtained from the aspen (*Populus tremula*), and is reputed to have anti-rheumatic and antipyretic powers in doses of 2 to 5 grs.

Benzoyl Thymol-sodium Oxybenzoate is known as Pyranum and Pyrenol—a crystalline soluble powder used in rheumatism and neuralgia, acting like the benzoate of soda, in 10 to 20 gr. doses.

Berberis Aquifolium (Holly-leaved Barberry) and other species of B. have been extensively tried in America made into a tincture (1 to 5). It is said to be an alterative and tonic in 20 min. doses, and has been reported useful in various forms of syphilis and struma. Berberine, obtained from it and from hydrastis and

calumba, possesses anti-periodic powers, and has been used as a substitute for quinine, in 5 to 10 gr. doses, in malaria. It possesses marked power in causing contraction of the malarial spleen.

Betaine is a derivative of lecithin, being Trimethyl-glycocoll, and is obtained from choline. The hydrochloride is known as Acidol, and owing to its power of liberating hydrochloric acid to the extent of one-fourth of its weight, it is administered in 5 gr. doses, with pepsin, in gastric affections.

Glycocoll is amido-acetic acid, and its mercury salt (Hydrargyrum glycocoll) is used in doses of $\frac{1}{8}$ gr. hypodermically in syphilis.

Betol is Beta-naphthol salicylate—a body in small white tasteless crystals analogous to salol, only having the base of naphthol. It splits up in the body into salicylic acid and naphthol. It has been given in rheumatism and cystitis with benefit, but sometimes without any result. Kobert affirms that it is preferable to salol in rheumatism; it may be given in doses of 10 grs. every 6 hours. It contains 10 per cent. less salicylic acid than salol. It is also known as Naphthalol, Naphthosalol, and Salinaphthol, but is seldom used.

Alphol is the corresponding salicylate of α -naphthol, and resembles salol in its action and dosage.

Bile Salts (Taurocholate and Glycocholate of Sodium), from ox-bile, have been used as solvents for gall-stones and in chronic constipation and dyspepsia. Dr. R. G. Price reports most favourably of the results of 5 gr. doses of both of these salts in gall-stone cases after twenty-one years' experience. Stadelmann in animals raised the quantity of bile excreted by 120 per cent. on administering these salts. The glycocholate is preferred, and it may be given in doses of 10 to 15 grs. in pills coated with keratin in gall-stone cases and in fatty or amyloid liver. Phisalix states that it is a chemical vaccine against viper poison, and Fraser has proved that bile contains an antitoxin against snake venom and some parasitic diseases.

Cholesterin, in doses of 15 to 30 grs. daily, has been given in pernicious anæmia and tuberculosis, and it has been proved to neutralise the poisonous action of strychnine when mixed with the drug before administration.

Choline is a hygroscopic syrupy substance obtained from bile, which has been used as a remedy for cancer, since it produces similar changes in the body cells as are effected by the X rays and radium. It also stimulates the action of the pancreas, liver, and salivary glands, and increases nitrogenous metabolism.

Ovogal is a compound of bile with albumin, existing as an almost tasteless greenish powder, used in 15 gr. doses as a substitute for the bile salts in intestinal dyspepsia, gall-stones, and constipation.

Paratoxin is a new bile derivative resembling cholesterin, obtained by acting on bile with petrol ether. It has been recommended, in 10 gr. doses, as an antituberculosis agent, since it contains lecithin.

Bismuth Salts.—The following salts of Bismuth are non-official :—
The Crystalline Nitrate, in 5 gr. doses, is employed like the official double citrate solution.

The Soluble Phosphate is used in acute gastric and intestinal

catarrh in doses of 5 grs. dissolved in 3j. water. It is an impure salt, and constitutes the greater part of the powder known as Biscol.

The Colloidal Oxide (Bismone) acts like the official oxide.

The Sulphite, a white powder soluble in acids, which gives off sulphurous acid in the stomach, has been recommended in fermentative states of this organ in doses of 5 to 15 grs.

The Subiodate is a fine white powder, consisting of nearly 50 per cent. iodine. It has been used as a dusting powder in scrofuloderma and lupus and also in the form of ointment (1 in 20).

The Oxyiodide is a red, heavy, insoluble powder used as a substitute for iodoform, and as an injection (1 in 100) for gonorrhœa, and in 5 to 10 gr. doses in gastric ulcer.

The Oxychloride is a soft, impalpable powder, which may be used for all the purposes for which the official insoluble salts are employed in the same doses. It is the popular cosmetic known as Pearl White.

The Oxybromide is an insoluble yellow powder, recommended in 5 gr. doses as a gastric sedative.

Of organic salts of bismuth there seems to be no end.

The Beta-naphtholate or Orphol and the Carbolate (Phenol-Bismuth) are insoluble powders, which split up slowly in the digestive canal, and the phenols act as disinfectants. They may be given in tuberculosis, cholera, and diarrhœa, in doses of 10 to 20 grs. Orphol is highly recommended in typhoid and the diarrhœa of children.

The Naphthalin-benzoate or Intestin has similar properties.

The Benzoate (oxybenzoate) is used as a stimulating powder for chancres and ulcers, and also for internal use.

The Tribromcarbolate or Tribromphenolate, also called Xeroform, is a yellow powder recommended as a specific against cholera, in doses of 8 grs. every two hours. It is one of the best of intestinal antiseptics, and may be used as a substitute for iodoform in the form of dusting powder or gauze.

The Iodide of Bismuth and Cinchonidine, known as Erythrol (not to be confounded with erythrol tetranitrate), is given in gastric neurosis in doses of $\frac{1}{2}$ gr. Martindale's title, "Bisciniod," for this drug is preferable.

The Sulphocarbolate or Sulphophenate is a pink powder given in 5 gr. doses as an intestinal antiseptic.

The Tri-iodophenylate known as Neoform is the corresponding salt to Xeroform and exists as a yellow insoluble powder with identical action.

The Lactate has been given in 5 gr. doses in gastrodynia and colic, and the Citrate has similar properties in somewhat smaller doses.

The Oleate is a bland, unirritating emollient used in intertrigo, etc. Anderson's ointment consists of bismuth oxide 1, oleic acid 8, white wax 3, white vaseline 9, and is useful in pruritus.

The Pyrogallate (Pyrogallol-Bismuth) is used in skin therapeutics; it differs from the other bismuth antiseptics in being soluble in alkaline secretions. It is also known as Helcosol.

The Subgallate known as Dermatol is a yellow amorphous insoluble and odourless emollient powder, which is used as a dry dressing like iodoform, for burns, ulcers, and wounds, as an emulsion

(1 in 20) in gonorrhœa, and as an internal astringent in 20 gr. doses in diarrhœa.

The Gallate of the Subiodide is known as Airol, Airoform, and Airogen. It is a light greenish, tasteless, insoluble powder, possessing powerful antiseptic properties, and has been used as an iodoform substitute and as an injection in gonorrhœa (1 in 10). It has been also successfully employed as an insufflation in gonorrhœal ophthalmia and corneal ulceration.

Ibit is the name given to the oxy-iodide-tannate, an allied body used for similar purposes; it is probably, however, not a definite compound. It is a greenish-grey insoluble powder, which makes a good gauze preparation.

The Bilacto-monotannate is a yellow, tasteless, insoluble powder, known as Lactannin; it is recommended in the diarrhœa of infants in doses of 5 grs.

The Tannate is a yellow powder possessing strong astringent action; it is given in all forms of diarrhœa, intestinal tuberculosis, and dysentery in cachets containing 20 grs.

Bismuth Methylendigallate, or Bismal, is used where the insoluble bismuth preparations are indicated, as in gastric ulceration and intestinal irritation. It is, moreover, markedly astringent, and has proved of much use in the diarrhœa of intestinal ulceration in doses of 15 grs. 3 or 4 times a day. Sprinkled over ulcers and in intertrigo its antiseptic and astringent qualities are already well recognised.

Loretinate of Bismuth is used as a dusting powder in eye cases instead of calomel; it is dusted on ulcers and wounds like iodoform, and has been administered internally in the diarrhœa of phthisis in 8 gr. doses. (See also Loretin.)

The Agaricate has been employed in the night-sweating of phthisis as a substitute for agaric acid.

The so-called Chrysophanate or Dermol is, according to Merck, a mixture of impure chrysarobin and a salt of bismuth.

The Basic Dithiosalicylate, or Thioform, is a light brown insoluble powder, which has given satisfactory results as a substitute for iodoform in every variety of ulcer and wound, including burns, in erysipelas, eczema, otitis, and dusted into the eye, ear, and throat in various diseased conditions. It is also an efficient intestinal antiseptic, and has given good results in diarrhœa, etc., in doses of 6 grs. *ter die*. The Basic Salicylate is now in the B.P.; it may be used as a substitute for iodoform. The Salicylate of Bismuth and Cerium has identical action and dose.

Bismuthol—the Sodium-phospho-salicylate—is a white powder used as an iodoform substitute mixed with talc (1 in 5). It is also given internally in solution.

The Peptonate is a brown powder, claimed to be the most easily assimilable of the bismuth preparations; it contains only $3\frac{1}{2}$ per cent. of the oxide, and may be given in teaspoonful doses. The Albuminate contains three times this amount of bismuth, and is given in intestinal affections in 30 gr. doses.

Bismutose is a white, tasteless, odourless powder, being a compound of bismuth 22 per cent. with albumin. It is recommended in gastric and intestinal affections, in 1 to 4 dr. doses, and as a dusting powder for burns, intertrigo, etc.

The Resorcinate is a yellowish powder, introduced as an iodoform substitute.

The bismuth salt of Nosophen is known as Eudoxin ; it is a brown, odourless powder, used as an iodoform substitute, especially in nose and throat cases. It has also been recommended in 15 gr. doses in diarrhœa and tubercular ulceration of the bowel. It is similar to Antinosin, which is the soda salt of Nosophen, which see.

The Sulphocyanide of Bismuth and Quinoline, known as Crurin, is another iodoform substitute, but it has not been much used except as a dressing in cases of ulcer of the leg. Jacobi extols it as a specific when injected (1 in 200) in gonorrhœa.

The Paranucleinate or Para-Bismuth is an insoluble pale yellow powder, containing 50 per cent. bismuth. As it passes unaltered through the stomach it acts as an intestinal antiseptic and astringent, useful in tubercular and other diarrhœas in doses of 5 grs.

Blatta Orientalis.—Cockroaches have been used by the Russian peasants for centuries as a remedy for dropsy ; when given in the form of powder, infusion, or tincture, they greatly increase the quantity of urine, diminish the amount of albumin, and rapidly reduce anasarca and ascites. Their virtues depend on *blattic acid*, which forms soluble salts with potassium and sodium. It slows the pulse in small doses and accelerates it in large doses, and causes falling of the blood pressure and paralysis of the cardiac muscle. Bogomolow named the active principle Antihydropin. He gave the powdered beetles in 4 to 5 gr. doses to children thrice daily. The tincture of blatta has been extolled in 2 min. doses in pertussis.

Boldoa Fragrans.—The leaves of the boldo-tree act as a powerful diuretic. Dose—10 to 20 mins. of a tincture (1 to 8) in gall-stones, atony of the bladder, cystitis, gonorrhœa, Bright's disease, rheumatism, and cirrhosis of the liver.

A glucoside, Boldo-glucin, has been isolated from the leaves ; it has been given for liver diseases, bladder affections, and gall-stones in 3 gr. doses in capsules and by the rectum as an hypnotic. The alkaloid, Boldine, is given as an hypnotic in doses of $\frac{1}{12}$ gr. It is also a local anæsthetic.

Bornyval is a colourless liquid, claimed to be the stable standardised active principle of valerian root. It is the iso-valerianic ester of borneol or oil of valerian. Recently its value as an anti-hysterical drug has been testified by numerous clinicians at home and abroad ; it is indicated in all the conditions where valerian has been used. The best results have been obtained in cardiac and abdominal neurosis. The drug appears to act by diminishing the hyperexcitability of the peripheral nerves, and it has proved useful in asthma and dysmenorrhœa. It is best administered in 4 min. capsules 3 or 4 times daily.

Valyl or Valerianic Acid Diethylamide is an oily liquid resembling valerianic acid, both of which substances have been given in 3 min. doses in hysterical affections, and the Valerianate of Amyl has been similarly employed as a valerian substitute.

Validol or Menthol Valerianate is a solution of menthol in valerianic acid given in 10 min. doses, and Validol Camphor is a solution of 10 per cent. camphor in this liquid. It is used as a local analgesic in toothache.

Brain and Spinal Cord Extracts (Cerebrin and Myelin or Medullin) have been employed in the treatment of various brain and spinal affections.

Cerebrin from the grey matter of the sheep's brain has been used in ataxia, hysteria, melancholia, nearly every form of neurosis, chronic alcoholism, and imbecility. The results are not very convincing, though it does not appear that in 5 to 10 gr. doses any untoward effects have been noticed. Poehl's Cerebrin (Opocerebrin) is administered to epileptics in conjunction with bromides. Merck's Cerebrum Siccum or Alpha-Cerebrin in 8 to 16 gr. doses by mouth has been advocated in psychoses, chorea, neurasthenia, tabes, alcoholism, and tetanus.

The same remarks apply to Spinal Cord substance. Dose—10 mins. of the liquid extract hypodermically or 5 grs. of the tabloids.

Bromal Hydrate, allied to chloral hydrate in chemical composition, is a powerful hypnotic, in doses so small as 5 grs., but it produces much gastric disturbance, and its internal use has been seldom resorted to. It has poisonous action upon the heart. Bromal, CBr_3COH , existing as a yellow oily liquid, has similar action.

Bromaline or Bromethylformine is a crystalline powder, containing about half the amount of bromine present in KBr. It is a combination of hexamethylenetetramine with ethyl bromide. It was introduced for epilepsy and other spasmodic affections. It is given in solution in water, or in tablets in twice the amount of the alkaline bromides, and it is claimed for it that the ordinary drawbacks—rash, fetor, and anorexia—do not occur, and the results continue to be reported as most satisfactory. Merck gave the name of Bromaline to it, and it is not to be confounded with Bromelin, which is the name given to a digestive ferment like papain, obtained from the juice of pineapple.

Brometone exists in white crystals, being tribrom-tertiary butyl alcohol. It has marked analgesic and hypnotic properties, and has been successfully employed in 5 gr. doses in sea-sickness.

Bromidia is an American preparation containing various hypnotic substances, mixed with bromide of potassium, and given in doses of 1 dr., which is stated to contain 15 grs. each of chloral hydrate and bromide of potassium, with $\frac{1}{8}$ gr. each of extract of Indian hemp and hyoscyamus.

Bromipin, or Brominol, is a yellow, oily liquid obtained by adding bromine to sesame oil. It contains $33\frac{1}{3}$ per cent. bromine, and is introduced as a substitute for the ordinary bromine salts in chorea and epilepsy, in drachm doses given in wine or mucilage or in capsules. The 10 per cent. bromipin may be given in 4 dr. doses by the rectum. This amount represents 40 grs. bromide of potassium.

Bromocoll is Dibromotannic glue, and contains 20 per cent. bromine. It is a brownish, odourless, and tasteless powder, which passes unchanged through the stomach. It can be given in wafers, in doses as high as 2 drs., and is recommended in epilepsy, and as a dusting powder for wounds. It passes unchanged through the stomach till it meets the alkaline secretions in the duodenum. It has been injected in solution hypodermically in tetanus.

Bromoform is a colourless, sweet-tasted liquid, analogous to chloroform, which has been used as a general anæsthetic, but its use is attended with such dangers and drawbacks that it should not be used for this purpose.

It has been found to control the violence of the spasms of whooping-cough, and has given excellent results in this disease in doses of 1 to 5 mins. ($\frac{1}{2}$ min. may be given every hour for 10 hours to a child 1 year old), in water made thick with sugar. It should be used with caution, but it is safe in doses of 1 to $1\frac{1}{2}$ mins. for each year of the child's age up to 7 years, the dose being diminished as soon as drowsiness appears.

Externally the liquid has been painted over painful spots, and applied to the larynx.

Bromo Hæmol is a compound of bromine with hæmoglobin, and is introduced as a substitute for the inorganic salts of bromine. As it contains less than 3 per cent. of this element, it must be given for long periods and in much larger doses (15 to 30 grs. in wafer) more frequently. It is indicated in hysterical affections in anæmic subjects.

Bromol, or Tribromphenol, is a white, crystalline, insoluble salt, prepared by the action of bromine on phenol. It is powerfully antiseptic and somewhat caustic. An ointment, 1 dr. to 1 oz., and a solution, 1 dr. in 4 ozs. olive oil, have been used as dressings to fresh wounds and ulcers. A solution of 1 dr. in 3 ozs. glycerin has been used as a swab in diphtheria.

Given internally in doses of $\frac{1}{2}$ to $1\frac{1}{2}$ grs. it passes unaltered through the stomach, and, reaching the alkaline secretions in the duodenum, it is dissolved and absorbed, and finally excreted by the kidney as tribromphenol-sulphuric acid. It has been given in doses of 1 gr. as an intestinal disinfectant in typhoid fever and diarrhœa. It is not to be confounded with Bromal (an oily liquid allied to Chloral). (See Bromal Hydrate.)

Bromopyrin is the monobromide of antipyrine existing as a white crystalline powder. It possesses marked antipyretic properties when given in cachets containing 5 to 15 grs.

Bromotan is a yellow powder introduced for the treatment of moist eczema; it is bromotannic acid-methylene-urea, and is used diluted with 5 times its weight of talc and zinc oxide, or as a 10 per cent. lanoline ointment for pruritus ani.

Bromural is α -monobrom-iso-valerianyl urea, existing in white needle-like crystals. This substance possesses very marked hypnotic powers, altogether beyond the small amount of bromine contained in its full hypnotic dose of 10 grs., the sedative action being mainly due to its isopropyl constitution. It induces apparently natural sleep within about 20 minutes with safety, and without producing any untoward effects. It has been given in 2 gr. doses with benefit in whooping-cough and various neurotic conditions, but it has no narcotic action. The drug is best given in tablets or dissolved in hot liquid when a speedy effect is desired.

Bryonia.—The fresh and dried roots of *Bryonia alba* and *B. dioica* are used in medicine. It is a hydragogue cathartic of dangerous power, and is given in dropsies. The fresh leaves are counter-

irritants, and will produce vesication. Bryony is believed to have a powerful effect in controlling *inflammations of serous membranes*. 5 to 10 mins. (B.P.C. Tincture) have been given in acute pleurisy with much benefit. It may be given where aconite is indicated in acute febrile conditions and in rheumatism. An infusion, 1 in 10, is strongly styptic.

Cactus or Cereus Grandiflorus.—The flowers and stems made into a tincture have been used in heart diseases. In painful palpitation from functional causes it has been stated to give great relief. Other observers state that it has cardiac tonic properties and diuretic powers like digitalis, and it has been administered in angina and valvular lesions with benefit in doses of 5 to 10 mins. of the fluid extract. The tincture (1 in 5) is given in doses of 5 to 20 mins. It has also been recommended in exophthalmic goitre. Some authorities deny that this drug possesses any cardiac tonic properties, but recently Curtin maintains that failures are entirely due to adulterations. There may be some such virtue in the Cactina obtained from *C. Mexicana*. It is given in doses of $\frac{1}{100}$ to $\frac{1}{50}$ gr.

Cæsium and Rubidium.—The bromides of these rare metals have been used in epilepsy and painful cardiac palpitation in 20 gr. doses. Botkin has published the results of a series of experiments made with the chlorides of these metals; his results in the main agree with those of Ringer. The pulse is slowed and strengthened and the arterial pressure raised. The pneumogastric centre and the peripheral inhibitory apparatus of the heart are stimulated. In other respects there is a close resemblance between their action and that of potash salts, and they may be given in similar doses.

Caffeine Salts.—The alkaloid and its unstable citrate are official, but many other caffeine compounds are in continual use, the following being the most important:

The Ammonio-Citrate—a white crystalline powder, given in doses of 2 to 10 grs.

The Dibromo-hydrobromide or Tri-bromide, in yellow crystals, given in 1 gr. doses in capsules.

The Hydrobromide, Hydrochloride, and Hydriodide—all unstable compounds resembling the citrate, and given in 2 to 4 gr. doses. The Sodium-Caffeine Iodide, or Iodo-Caffeine is a white crystalline powder, possessing diuretic powers like the symphorols when given in 10 gr. doses.

The Di-iodo-hydriodide or Tri-iodide, in steel-greyish-black, iridescent prismatic crystals, recommended in gout in 1 to 3 gr. doses in pills.

The Sodio-salicylate is a white amorphous powder, soluble in its own weight of water. The Sodio-benzoate is a similar compound. Both may be given in doses of 2 to 10 grs. hypodermically. Migralgine is a mixture of caffeine 9, salicylic acid 3, and antipyrin 88, fused and powdered. It is given in grain in 15 gr. doses.

The Sulphonates or Symphorols, of which there are three, are designated by the letters L, N, and S, indicating the symphorols of lithium, sodium, and strontium. They are powerful diuretic salts in doses of 15 grs. in wafers. The N, or sodium, symphorol is also known as Nasrol.

The Valerianate—a white crystalline powder, being a mixture of varying amounts of valerianic acid and caffeine, is given in hysterical conditions, in pills containing 1 to 3 grs.

Migranine is a crystalline compound—the caffeino-citrate of antipyrine, containing 90 per cent. antipyrine, given in 10 gr. doses for sick headache.

Caffeine-Chloral, according to Martindale, is a compound of caffeine and chloral in the form of soluble granular crystals, said to be a laxative when injected hypodermically in 3 to 8 gr. doses. The injections give relief in sciatica.

Calcium Salts.—In addition to the official salts of calcium, many others are frequently employed in medicine.

The Borate is a white insoluble powder administered internally in diarrhœa in 10 to 15 gr. doses, and used as a dusting powder in skin diseases, and as an ointment for burns and gangrenous ulcers and sloughing wounds.

The Bromide is a white soluble crystalline powder given in 15 to 20 gr. doses in epilepsy.

The Carbide is a greyish-black solid substance which has been introduced as an agent for the production of acetylene gas in the treatment of cancer. When applied to ulcerating growths it is claimed for it that the lime acts as a caustic, and the acetylene gas checks hæmorrhage and fetor.

The Cresotinate is only used as a disinfectant.

The Formate is a white crystalline salt given in 5 to 10 gr. doses as a substitute for sodium formate. It is an antiseptic, and is used as a remedy for muscular rheumatism.

The Fluoride has been recently extolled as an internal remedy in caries of the teeth and ununited fractures in doses of $\frac{1}{2}$ gr.

The Glycerophosphate, already mentioned, is a powerful alterative and nerve tonic in doses of 5 to 10 grs.

The Hippurate is a soluble white powder like the corresponding soda and ammonia salts given as a diuretic in gout and stone in the kidney in 10 to 20 gr. doses.

The Iodate, or Calcinol, is a tasteless, odourless sparingly soluble powder, introduced as an iodoform substitute, and occasionally given in 5 gr. doses as an intestinal disinfectant. It is useful as a gargle and mouth-wash.

The Iodide is a deliquescent crystalline solid which has given remarkable results in chronic eczematous ulcers of the leg and in tubercular ulcerations when given internally. It must be largely diluted, and the dose should not exceed 5 grs.

The Iodo-ricinoleate is introduced as a method of administering iodine where the absorption is intended to be from the intestinal surface; the drug is given in 3 gr. capsules.

The Iodo-sebacate is a white, tasteless powder containing 26 per cent. of iodine, and is used as a substitute for iodide of potassium in tertiary syphilis when given in doses of 15 grs. It is known as Sajodin.

The Lactate is a white powder given in 15 gr. doses in all cases where the chloride is indicated. The Lactophosphate is a much less reliable preparation, of varying composition.

The Naphthol sulphionate is described under Abrastol.

The Pentasulphide is the active ingredient in Vlemingx's solution, used for scabies.

The Permanganate is a salt closely resembling permanganate of potassium. It has been used in solution under the name of Monol to purify drinking water in France. It is claimed for this salt that it is 100 times more powerful in its antiseptic and bactericidal action than the potassium compound. A solution of 1 in 1,000 is used for disinfecting instruments, 1 in 300 for the surgeon's hands, 1 in 500 for the vagina, uterus, and urethra. It is better for gargles and mouth washes than the potash salt, since it tastes better. $\frac{3}{4}$ gr. will sterilise 1 gall. water.

The Peroxide is a yellow powder, which in presence of water splits up into the hydrate and oxygen. It is valuable in 2 to 4 gr. doses when given in milk for the diarrhoea of children. It is known as Gorit, and is the active ingredient in the dentifrice known as Calox.

The Saccharate is represented by the official liquor. The dose of the salt is 10 to 30 grs. Mono- bi- and tri-saccharates are also known, but little used.

The Salicylate is odourless, and has a sweetish taste; it is administered in suspension in water as a substitute for the chloride, and being only slightly soluble is given in those cases where an intestinal action is desired. It resembles salicylate of bismuth in action and dose (5 to 20 grs.).

The Sulphite and the Bisulphite are powerful disinfectants and antiseptics used for food preservation.

The Sulphate is mainly used, when dried, for its mechanical properties in splints. The undried sulphate is given in phosphaturia in 30 gr. doses, and the dried (Plaster of Paris or Gypsum) has been successfully employed as an application in smallpox, and as a dry dressing for wounds.

Camphoid is a substitute for collodion, introduced by Martindale. It is prepared by dissolving pyroxylin in 20 times its weight of absolute alcohol and of camphor, and may be made the medium for the local use of iodoform, chrysarobin, etc.

Camphor Naphthol is prepared by heating 1 part of beta-naphthol with 2 parts of camphor. It is used in tinea and other parasitic skin affections, and has been injected into tuberculous glands, but occasionally grave results have followed this practice. Phenol Camphor is made of different strengths, and is used for similar purposes. 1 of camphor in 3 of carbolic acid and $\frac{1}{4}$ water is the usual proportion.

Camphor Salol is an oily liquid, prepared by fusing 3 parts of salol with 2 of camphor. It is used as an application in tinea, and on wool for suppurative conditions of the middle ear. Camphor Salicylate (Camphossil) is a similar substance in solid form, prepared by heating 7 parts camphor with $5\frac{1}{2}$ salicylic acid. It may be applied to the scalp in tinea or to ulcers in the form of ointment 1 to 3, and has been administered in pills in 1 to 5 gr. doses.

Chloral Camphor is a liquid obtained by heating equal weights of chloral hydrate and camphor; it is a local anæsthetic painted over painful nerves. Thymol and Resorcin Camphors are oily liquids obtained by heating these substances with an equal weight of

camphor ; they are powerful germicidal applications. Oxy-camphor is a white powder used internally in doses of 15 to 30 grs. in pulmonary dyspnœa, generally given in the form of "Oxaphor," which is a 50 per cent. alcoholic solution.

Camphora Monobromata exists in long acicular crystals in which bromine replaces an atom of the hydrogen of camphor. In large doses it produces great muscular prostration, convulsions, reduction of temperature and pulse, slowing of the respiration, coma, and death. In medicinal doses (5 to 10 grs.) it has been used in delirium tremens, epilepsy, hysteria, chorea, neuralgia, pertussis, and asthma ; not with sufficiently good results to warrant its use when better known available remedies are at hand. The drawbacks to its use are its unpleasant smell and taste, its irritative effect upon the stomach, and the local irritation following after hypodermic injection. It is best given in the form of pill or capsule.

Camphosan is a 15 per cent. solution of camphoric acid-methyl-ester in santalol—an alcohol obtained from santal oil. The resulting oily liquid has been found of great value in urethral, prostatic, and bladder affections when administered in 10 min. doses in capsules.

Cannabin Tannas is a yellowish powder obtained from Indian hemp. Frommüller has found it "a useful hypnotic, powerful without being dangerous, and one which does not disturb the secretions or leave unpleasant toxic after-effects if given in proper dose." Dose—5 grs. in powder ; for insomnia it may be increased to 10 grs.

Occasionally, good results have followed its administration in acute mania. Wood found it to be inert, and Marshall states that it is of little value, and the reports are contradictory, perhaps from the varying purity of the samples of the drug experimented with. Cannabinol is the active principle of Indian hemp. It is a red oily substance, which is very prone to oxidise upon exposure, and soon becomes inert, though a powerfully toxic substance when fresh.

Cannabion is a purified, very soft resin obtained from Indian hemp ; though much more certain and powerful than the previous drug, it, too, occasionally proves inert. It has been given with good results in the sleeplessness of mania in doses of $\frac{1}{4}$ to 1 gr. rubbed up with sugar of milk. Haschischin is the name given to a brownish powder prepared from the alcoholic extract, which is variable in its effects.

Cantharidin (Lactone of cantharidic acid) occurs in flat, glistening crystals. 1 in 300 of acetic ether will cause vesication. It is a powerful irritant poison. Liebreich introduced cantharidinate of potassium as a remedy in *tuberculosis*, but it has fallen into disuse. The dose should not exceed $\frac{1}{100}$ gr.

An attempt was made to revive this treatment, and Liebreich advised pure cantharidin, to be taken internally and not injected. He gave it for lupus and pityriasis rubra in doses of $\frac{1}{1000}$ gr. in pill (fasting) daily.

Carbonic Acid Gas plays an important part in Schott's treatment of heart diseases at the Nauheim baths. An artificial sulphur bath saturated with CO₂ can be easily prepared from the solid ingredients (sodium bisulphate and bicarbonate), procurable from most pharmacists, and there is no difficulty in carrying out the treatment at home.

At Harrogate the Nauheim bath can be prepared with natural sulphur water and CO_2 , and the writer has satisfied himself of its advantages by observations made upon the spot. Inhalation of the gas has been recommended in leucocythæmia and pertussis, and carbonic snow has been used as a cold application for the relief of local pain, and for the destruction of nævi.

Carbonis Tetrachloridum.—The vapour of this colourless, mobile liquid will produce general anæsthesia, like chloroform, but its effects are very transitory, and it is seldom used except to relieve local pain and discomfort, as in hay fever, asthma, tic, etc., when the vapour may be inhaled with benefit. When applied over the seat of neuralgic nerves and pained joints it gives relief speedily. It can be applied upon lint, and covered over with thin mackintosh. It is used as a solvent of iodine and indiarubber under the name of Dermagumit—a liquid intended to sterilise the hands in abdominal operations, and to take the place of rubber gloves.

Cardin (Heart Extract) is the name given to a purified extract obtained from the cardiac muscle of the ox by Hammond, who introduced it for the treatment of failing compensation and other affections of the heart, but the results are unsatisfactory.

Carlsbad Salt (Sal Carolinum) owes its therapeutic virtues to the chloride, sulphate, and bicarbonate of sodium in its composition; the following is the German Pharmacopœial formula for the artificial salt: dried sodium sulphate 22, potassium sulphate 1, sodium chloride 9, sodium bicarbonate 18. It may be used also as artificial Marienbad salt. It is a mild saline purgative in dessertspoonful doses, dissolved in a tumblerful of water, in constipation associated with diseases of the kidneys and liver, and in gout, rheumatism, etc. The natural salt is no doubt more valuable, as it contains all the constituents of the natural Carlsbad water, but the natural salt in *large* crystals, though valued most in this country, is much inferior to the *fine* crystals which are now prepared with the greatest care at the Springs, being, after their production from a concentrated solution of the natural water, submitted for long periods to an atomised spray of the same liquid.

Carpaine is an alkaloid obtained from the leaves of *carica papaya*—the source of papain. It is a cardiac poison, in large doses paralysing the heart muscle. It acts like digitalis in valvular disease—especially, it is said, in aortic affections—and it acts with great rapidity when given hypodermically, in doses of $\frac{1}{16}$ gr.; it slows the pulse, relieves dyspnœa, and increases the urine, and never causes irritation at the site of puncture. (See also Papain.)

Casca Bark (*Erythrophlœum guineense*), or Sassy Bark, closely resembles digitalis in its effects. The dose is 10 mins. of Brunton's tincture (1 in 10). Sansom employed the tincture substitutively for digitalis in a considerable number of cases, but was unable to convince himself that it has any more beneficial effect in mitral disease. Brunton has found it useful in dilated heart without valvular disease, in mitral disease, and in dropsy. Its alkaloid—Erythrophlœine—is given in doses of $\frac{1}{12}$ gr. The hydrochloride has powerful anæsthetic properties, and is used in 1 in 400 solution in ophthalmic

practice. Under the name of Throphleol, a 50 per cent. solution in eugenol effectually removes the pain of exposed nerve pulp in dental caries.

Casein is the albuminoid substance present in milk, and which constitutes the chief bulk of cheese; it is employed as the basis of many artificial foods, as Plasmon, Virogen, Casumen, Nutrose, etc. The last-mentioned substance consists of pure caseinate of sodium, 1 oz. of which will dissolve in a pint of heated milk, and may be used as a food in marasmus and diarrhœa and stomach diseases. (See also Eucasin, Sanatogen, Sanose, and Somatose.)

Caulophyllin.—An eclectic resinoid remedy prepared from the root of *Caulophyllum thalictroides* (U.S.P.), blue cohosh, or squaw root. It is a brownish powder, best given in form of pill, 1 to 4 grs., and is recommended as a diuretic, emmenagogue, and parturient. It has been given with some success as an anthelmintic.

Cedron.—Simaba Cedron seeds have been long employed by the natives of New Granada as a febrifuge and antidote to bites of venomous animals. They contain a bitter principle which appears to have antiperiodic powers like quinine. The powdered seeds in 5 gr. doses have been given in malaria, dysentery, cholera, and facial neuralgia, and have been employed in gout, and in smaller doses in atonic dyspepsia.

Celloidin is a purified pyroxylin occurring in yellow strips; when dissolved in ether, it makes a very strong collodion, and its solution in acetone is known as Filmogen. Photoxylin is a nitrated wood-pulp which is said to make a more durable collodion. "New Skin" and Rubber Glove substitute are solutions of these varieties of pyroxylin, which are intended to act like the preparation named Dermagumit described under Carbonis Tetrachlor.

Ceresin is the name given to a firm white hydrocarbon, which is prepared from ozokerit. It is recommended as a basis for ointments and cerates. It should not be confounded with a dry extractive substance called Cerasin or Prunin, prepared by evaporating a tincture of Virginian prune, and given in doses of 5 grs. in bronchial affections.

Cetrarin.—Since Iceland Moss has been removed from the B.P. a notice of its active principle may be inserted here. It has been much praised on the Continent as a remedy in the catarrh of early phthisis, and in amenorrhœa and chlorosis; in the latter case mixed with organic iron salts. Its dose is 1 to 2 grs., and it is reported that appetite improves, weight increases, and the richness of the blood becomes marked. In larger doses it is a laxative and bitter tonic.

Chaulmoogra Oil is expressed from the seeds of *Gynocardia odorata*. Its active principle, Gynocardic acid, is the most convenient form for the use of this drug. It may be given in doses commencing with 1 gr. three times a day, and may be pushed till 3 grs. three times a day are taken in capsules or pills. 5 mins. of the oil may be given in capsules. In India the oil is a fluid, but in this country it generally remains solid; it has been used as an external application with friction to the chest and abdomen in phthisis, tabes mesenterica,

struma, into the skin over joints the seat of chronic rheumatism and rheumatic arthritis; also with some advantage in very chronic eczema, leprosy, lupus, and psoriasis. The best application in the various stages of leprosy is an ointment composed of 1 part of the oil with 2 of lard; though there is no evidence that this has cured the disease, it certainly, when used at the same time as the acid internally, does possess considerable power in retarding the progress of leprosy. (See Colonial Addendum.)

Chelidonium Majus (Greater Celandine or Swallow-Wort—Papaveraceæ), has been long used as a local agent for the cure of warts; the yellow juice being painted over them causes their destruction. Denisenko has reported in glowing terms the results of the drug when given internally in various forms of cancer. About 1 dr. of the stalks should be taken daily, and 2 drs. of the extract dissolved in water should be injected every 48 hours into the tissues surrounding the tumour. Other observers report that the results are nil, and the drug is again rapidly passing into disuse. In large doses it is a purgative.

Chelidonine, its active principle, is given in doses of 1 to 3 grs.

The Lesser Celandine—a ranunculoid plant known as Pilewort—is a popular remedy for hæmorrhoids, when made into an ointment, by digesting it with lard.

Chian Turpentine is the semisolid oleo-resin, obtained by puncturing the trunk of *Pistacia Terebinthus*. It mainly derives its interest from the reports of its marvellous powers in the treatment of cancer by Clay, but it has now passed into disuse.

Chimaphila Umbellata leaves, under the name of Pipsissewa, are recommended in tuberculosis of the lymphatic system. Wood believes that this remedy comes near to cod-liver oil and iodine; his opinion is supported by that of many others, who state that it is not only an astringent, but a valuable alterative and tonic. It has an action on the bladder like *Uva Ursi*, and has been used extensively in cardiac dropsy, cystitis, and gleet, in doses of 1 dr. of the liquid extract (1 in 1).

Chinolinum is an oily liquid derived from quinine. It is artificially prepared from nitro-benzene and aniline. It is a powerful antiseptic and formerly was tried as an antipyretic and as a pigment in diphtheria. Its smell, taste, and irritating qualities are barriers to its use. The Tartrate is soluble, and may be given in doses of 5 to 20 grs. in water in ague and neuralgia. The Salicylate may be used in similar doses. These salts have been used locally in dilute solutions (1 in 100) as antiseptics in gonorrhœa and other affections.

Chinosol, or **Quinosol**, is the oxychinoline sulphate of potash, which, as a yellow soluble powder, was introduced as a disinfectant for the hands in surgical and gynæcological practice (3 per cent. solution) as a substitute for hyd. perchlor. It is a powerful germ destroyer and hæmostatic, but it irritates fresh wounds. Mixed with five times its weight of boric acid, it has been used as a substitute for iodoform, and it has been given in 3 gr. doses in phthisis, and recently with notable results in Asiatic cholera. It has been used as an injection for the preservation of dead bodies, as it does not affect the colour of the tissues.

Chloralamide, or Chloral Formamide, is an hypnotic in colourless crystals, which are slightly bitter, soluble in water, and incompatible with alkalis. It was introduced as a substitute for chloral hydrate, and it was claimed for it that it was more pleasant to take, and possessed no objectionable cardiac depressant action. Its hypnotic power is estimated as about $\frac{2}{3}$ that of chloral. It has been given in doses ranging from 25 to 45 grs. dissolved in water. It acts well in simple insomnia, but fails in moderate doses when pain and excitement are present.

Charteris obtained good effects from it in sea-sickness, and it has been used in whooping-cough, chorea, epilepsy, etc. Under the name of Chlorobrom it has been recommended in 15 gr. doses with 15 grs. bromide of potassium in sea-sickness and insomnia, and as a gastric sedative.

Chloralimide is an hypnotic, differing from Chloralamide, and prepared by the action of heat upon chloral ammonium. It exists in colourless, tasteless, odourless crystals, insoluble in water, and in doses of 20 grs. possesses analgesic and antipyretic properties. It does not possess any superiority over chloral when given in similar doses as an hypnotic, and it is passing into disuse.

Chloralose (Anhydro-glyco-chloral) is an hypnotic in colourless needles, obtained by the action of chloral on glucose. It causes deep sleep, coming on in a few minutes, sometimes preceded by excitement and visual disorders and marked muscular tremors or contractions: these latter may appear during sleep, and sometimes dilatation of pupils, great slowness of pulse, and involuntary evacuation of the bladder and bowels have been observed. It is doubtful if the drug should be given where there is organic brain or spinal disease. Epilepsy, mania, and simple insomnia seem to indicate its exhibition, but there is danger in repeating the dose, as it may not be absorbed. It does not appear to possess any advantage over chloral hydrate, and it certainly is not safer.

Cinchonine, **Cinchonidine**, and **Quinidine**, are the three out of the thirty-one alkaloids of cinchona bark which come next to quinine in therapeutic value, quinidine being much more active than the other two. They are much less frequently employed than formerly, owing to the cheapness and almost unlimited supply of quinine. The dose of quinidine is about $1\frac{1}{2}$ times that of quinine, while the other two must be given in dose of about $2\frac{1}{2}$ times the dose of quinine, in which amounts they are badly borne by the stomach. Antiseptol is a salt of cinchonine for external use. (See Antiseptol.) The Sulphocarbolate and the Sulphocresotate are recently introduced as antiseptics. The Tartrate and the Tannate are given in 5 gr. doses. The Salicylate of Cinchonidine is used as an antirheumatic remedy in 10 gr. doses. The Iodine and Bismuth salt (Bisciniod) is referred to under Bismuth Salts.

Citrophen (Para-phenetidin citrate) is a white powder, being a combination of citric acid with paraphenetidin, acting like phenacetin. It was urged that as an analgesic and antipyretic no danger whatever followed its use. It is certainly a most efficacious agent for relieving pain and reducing fever, but Trupez points out that it is decomposed in the system, and that one of the products is irritating

to the kidney and intestines ; the dose is 8 to 15 grs. It causes considerable sweating. It has been given in pertussis with success. Amygdophenin is an allied salt, given in similar dose in cachets as an analgesic and antirheumatic remedy.

Apolysin is monobasic paraphenetidin citrate, and possesses properties similar to citrophen.

Cobalto-nitrite of Potassium is prepared by adding an acidulated solution of a cobalt salt to a solution of nitrite of potassium. The resulting salt is more stable, less soluble, and more uniform and purer than the other nitrites. Given in doses of $\frac{1}{2}$ gr. every two hours it acts like nitroglycerin, and may be given in every case where it or nitrite of amyl is indicated, viz.—angina pectoris, uræmia, high arterial tension from whatever cause, and in asthma. The action of the drug is apparent inside 30 minutes, and it lasts for three hours.

Cocaine Salts.—Only the pure alkaloid and the hydrochloride are official, but many other salts are used, all of which may be given in doses of $\frac{1}{20}$ to $\frac{1}{2}$ gr.

The Carbolate or Phenylate is a semisolid salt, almost insoluble in water. It possesses the following advantages over the official salt—its local action is slower and more prolonged ; owing to its lesser solubility it is not absorbed so rapidly, and hence deleterious effects are not observed when freely applied to fresh wounds, and it is an antiseptic. It is used much in dentistry.

The Citrate is also chiefly used in dentistry ; it is deliquescent and soluble.

The Formate exists in crystalline needles soluble in about 40 times their weight of water.

The Lactate, a white semisolid, is used by Wittzack for injection into the bladder in tubercular cystitis. He injects $1\frac{1}{2}$ grs. with 6 mins. lactic acid and 9 mins. water into the empty bladder twice a week, gradually increasing the amount of acid.

The Nitrate is a very soluble salt, selected when cocaine is required in eye or urethral surgery in conjunction with nitrate of silver solution.

The Salicylate is used in asthma hypodermically. The Nitrate, Hydrobromide, and Sulphate may be regarded as identical in action with the official salt.

The Hydriodide of Cocaine has been used in dental surgery for producing electro-anæsthesia, but the hydrochloride is very suitable for ionisation by the ordinary cataphoresis method. The writer thinks that the injection of the solution into the soft tissues round the tooth is quite as effectual, but the limit of dosage is $\frac{1}{2}$ gr., and Martindale's Dental Anæsthetic preparation is very suitable.

Tropacocaine, obtained from Java coca, is more rapid, and it is alleged more safe and less irritating in eye cases. 3 per cent. solution of the Hydrochloride is used, and it does not dilate the pupil. It is injected in dental cases as more rapid and safe. It is more stable, and, since it has been produced synthetically, it is now to be found pure, and its solution keeps well. 1 per cent. solution causes anæsthesia in $2\frac{1}{2}$ minutes. The drug is also less poisonous than cocaine. It is also known as Benzoylpseudotropeine hydrochloride (Cocaine B.P. being methyl benzoylcegonine). It is suitable for the induction of local anæsthesia by the infiltration method

(0.01 per cent. solution with adrenalin). It is very suitable for administration by lumbar puncture (15 mins. 6 per cent. solution).

The official alkaloid and hydrochloride of cocaine are used in a variety of non-official combinations ; thus, Cocaine-menthol-phenol is an application for insertion in dental caries made by liquefying equal weights of these drugs, and a 5 per cent. solution of the alkaloid in oil of cloves has similar anæsthetic powers. Cocaine-Lanolin 10 per cent. is used for the same purpose. Cocaine Collodion 2 per cent. in flexible collodion is used as an application for chilblains, and the Oleate of cocaine soluble in oils is used for suppositories, pessaries, and bougies.

Acocaine is used chiefly in eye surgery ; it is the Di-para-anisyl-mono-phenethyl-guanidine hydrochloride in white crystalline powder, soluble in 50 parts of water, and believed to be less toxic than cocaine.

(See also Alypin, Eucaine, Holocaine, Orthoform, Nervanin, Novocaine, Stovaine, and other synthetic cocaine substitutes mentioned under their own headings.)

Colchicine and Coniine are the active principles of colchicum and conium suitable for hypodermic injection when the actions of these drugs are indicated, the former in $\frac{1}{32}$ gr. doses in painful joint affections, chronic rheumatism, and gouty troubles ; the latter in $\frac{1}{2}$ min. doses in acute mania. Success is reported in tetanus by Demme with hourly injections of $\frac{1}{16}$ gr. of Coniine Hydrobromide, and Gometz has used the same salt in tinnitus aurium in doses of $\frac{1}{32}$ gr. with much benefit. Good results are obtained in gout, rheumatism, and rheumatic arthritis by doses of $\frac{1}{80}$ gr. Colchicine Salicylate, which is now obtainable in capsules, each of which contains $\frac{1}{80}$ gr. dissolved in methyl salicylate ; it is also known as Colchisal. Recently Houdé strongly recommends pure Colchicine in $\frac{1}{80}$ gr. pills in gout as a preventive of attacks.

Collinsonia Canadensis, known as stone or knob root, has been used in America for a host of ailments, though practically nothing is known of its physiological action beyond that it acts as a local astringent in small, and a mild cholagogue purgative in large doses. The dose of the root is from 15 to 60 grs. ; fluid extract (1 in 1), 15 to 60 mins.

It is a sedative to the urinary mucous membrane in obstinate gonorrhœa, gleet, and in cystitis, and has been proved valuable in hæmorrhoids and in anal spasm. As an antispasmodic, it has been used in whooping-cough, chorea, and in cardiac palpitation. Externally, it is used for wounds and bruises like arnica, but it is free from the objections to which arnica is open.

Colloid Styptic (Richardson).—Prepared by making a saturated solution of tannin and gun-cotton in absolute alcohol and ether, and adding a few drops of tincture of benzoin.

The solution is a most valuable styptic applied to wounds with a brush or in the form of a spray. 20 grs. Carbolic Acid added to each ounce form Carbolic Colloid, used as a local anæsthetic. Anodyne Colloid is described under Amyl.

Salicylic Colloid or Collodion, is 1 part of salicylic acid dissolved in 5 of flexible collodion with a little Indian hemp added ; it is used as

a corn cure. Salol Collodion is salol and ether dissolved in 8 parts of collodion ; it is used as a local application in rheumatism. Iodine Collodion is made by dissolving 30 grs. iodine in 1 oz. flexible collodion.

Combretum Sundaicum, like *Mitragyna speciosa*, is a plant whose leaves and stalks are believed in the East to possess anti-opium powers, and have been used by the Chinese to cure the habit of opium-eating. It belongs to the Combretaceæ, which contains also several closely allied plants. The usual method of using the drug for the cure of morphism is to prepare a concentrated decoction of the drug 2 ozs. to 1 quart, of which 1 oz. is administered every 3 hours with gradually decreasing amounts of morphia. Martindale gives the dose of liquid extract (1 in 1) as 1 c.c. The only constituent of the drug hitherto isolated is a resinous body, discovered by E. F. Harrison.

Combretum Raimbaultii is a West African remedy for blackwater fever, a decoction of the leaves being administered as a substitute for quinine.

Condurango Bark (*Gonolobus condurango*) was introduced by Friedreich for cancer of the stomach, and surprising results were at first reported of its action in relieving the pain of gastric ulcer and cancer and dyspepsia. It has no curative action in cancer, but it is a valuable gastric sedative in ulcer, cancer, and hæmatemesis. 30 to 60 mins. of the liquid extract (1 in 1) may be given four times daily.

Convallaria Majalis (Lily of the Valley) has been long in use by the peasants in Russia for dropsies. It has been found to possess powers resembling digitalis, and it is said without objectionable qualities.

It contains two glucosides—one, *convallarin*, is a drastic purgative in large doses ; the other, *convallamarin*, is a cardiac tonic. The most active preparation of the drug is an extract made from 1 part of the root and leaves, and 3 parts of the flowers and stalks ; this may be given in 5 gr. doses, but the most uniform action is obtained from convallamarin, which is a whitish powder, and may be given in doses of 1 gr.

1 gr. of the dried flowers, infused in 1 oz. water, and given every four hours, is a convenient method for administration. In valvular disease, with cardiac failure, decidedly beneficial results have been obtained.

Coronillin is a cardiac tonic, being the glucoside obtained from the seeds of *Coronilla scorpioides*. It acts like digitalis in failing compensation, in doses of 1½ grs. every 4 hours, and it is claimed for it that it acts with rapidity, and its action is not prolonged after stopping the last dose, and it does not affect the stomach. The dose of the tincture of the seeds (1 in 8) is 30 to 45 mins.

Coryfin is the ethyl glycolic ester of menthol ; it is a colourless and almost odourless fluid, which gives off menthol when applied to the skin and mucous membranes, and has but slight irritating properties. It has given good results in catarrh of the upper respiratory tract when used as an inhalation or in the form of bon-bons, or painted over the nasal membrane. It gives marked relief when

painted over the site of neuralgic nerves, and over the forehead in migraine. 3 to 5 drops on sugar may be administered every 3 or 4 hours.

Coto Bark is a Bolivian drug, yielding an active principle called Cotoin. Paracoto yields Paracotoin, which is weaker.

Cotoin has proved very valuable in the treatment of the diarrhœa of children, and in the diarrhœa of phthisis, teething, marasmus, and intestinal catarrh, especially in the feeble-minded and insane, and in the sweating of phthisis, and it has been tried in cholera with marked success. It is not an astringent, and has but feeble antiseptic power, and Albertoni thinks it acts by increasing the intestinal absorption (through dilatation of the bloodvessels), the diminution of which is the cause of the diarrhœa. It is contra-indicated in hyperæmic states of the abdominal organs, or in hæmorrhage from the bowel, or in acute catarrhal conditions. The dose is 1 to 2 grs. of cotoin and 2 to 3 grs. of paracotoin. Fortoin (Methylenedicotoin), a compound of cotoin and formaldehyde with similar action, and in doses of 4 grs., has been recently much praised in diarrhœa. The dose of the tincture of coto bark (1 in 10) is 15 to 30 mins., and of the liquid extract (1 in 1) 2 to 5 mins.

Coumarin (Ortho-oxy-cinnamic Anhydride) is the odorous principle of the Tonquin bean; it exists in colourless crystals, and has been prepared synthetically from salicylol. Its chief use in medicine is for disguising the objectionable odour of iodoform when added in the proportion of 2 per cent.

Coumaric Acid (*o*-hydroxy-cinnamic acid) is obtained from coumarin; the sodium salt is used as an anticancer remedy.

Creosal (Tannosal, or Tannate of Creosote) is a brown powder which combines the action of its two constituents. It is dusted on like iodoform in nasal and throat diseases, and given internally in cachets of 15 grs. in phthisis and tubercular disease of the intestine. It contains about 40 per cent. tannin.

Creosotal, or Creosote Carbonate, is a honey-like liquid obtained from pure beechwood creosote. It breaks up slowly in the intestine into creosote and CO₂. It increases the appetite, and is easily swallowed, and may be given in doses of $\frac{1}{2}$ dr. 4 times a day in milk, cream, or wine. It is claimed for it to be equal therapeutically to pure creosote in phthisis and in every form of tuberculous disease, bronchitis, and in gastric affections. Weber has reported most favourably of the action of the drug in acute pneumonia, in which disease he affirms that it is antidotal to the toxins.

Oleocreosote is an oily liquid resembling creosotal, being the oleic ether of creosote; it is given in 30 min. doses.

Sulfosote is a brown syrupy liquid, being the creosotic sulphonate of potassium; it is used in phthisis like creosote, the dose of the syrup being 2 drs.

Pneumin is the name given to a yellow, tasteless, odourless powder, which is a compound of creosote and formaldehyde, containing the active methylphenols and their ethers, which are found in beech tar. It is used as a substitute for creosote in phthisis, in doses of 8 grs., three or four times a day.

Creosoforme is a greyish powder, which also is a compound formed with creosote and formaldehyde, but it is really a guaiacol methylene derivative.

Creosote Phosphate, or Phosote, is a liquid resembling creosotal, and is given in similar doses, and the Tannophosphoric ester or Taphosote is also similar in dose and action, and is astringent.

Phosphotal is the name given to Creosote Phosphite, in solid crystals. Its dose is that of creosote—*i.e.*, 1 to 5 grs.—and its action is identical.

The Valerianate, or Eosote, is an oily liquid best given in 5 to 7 min. capsules as a substitute for creosote, being devoid of corrosive action.

Cryogenin (meta - benzamine - semicarbazide) is a crystalline, sparingly soluble coal-tar derivative, with antipyretic properties resembling those possessed by phenacetin. It has been given in 5 to 15 gr. doses in typhoid fever, and in the fever of tuberculosis.

Cumol (Cumene or Trimethyl benzene) is the name given to a fluid obtained from coal-tar oil, which has been found most valuable for the sterilisation of catgut, after boiling for two hours. The catgut is afterwards to be washed in petroleum benzene. Isopropylbenzene is also known by the same name, and is used for similar purposes.

Curara, Woorara, Urari, or the South American Arrow Poison, is a dried extract, the product of various *Strychnos* and unknown plants. Injected hypodermically or thrown direct into the blood stream, it produces profound muscular relaxation, if the dose be large enough, general muscular paralysis soon results, and death follows from stoppage of the respiration, preceded by convulsions owing to the blood becoming saturated with CO₂. The heart's action persists to the end, and the centres and sensorium are unaffected, the action of the poison being upon the peripheries of the nerves, supplying voluntary muscle. When swallowed, the kidneys are able to excrete it so rapidly that a large dose may produce no effect. It has been used subcutaneously in chorea, $\frac{1}{15}$ gr., in hydrophobia and tetanus, and, it has been stated, with some success in the latter diseases in doses of 6 mins. of B.P.C. injection (1 in 10).

Böhm's Curarine is a powder free from curine, and representing the active principle of curare. It is given hypodermically in $\frac{1}{75}$ gr. doses.

Cypripedin is a dried extract of *Cypripedium pubescens*—known as Ladies' Slipper. It is recommended as an antispasmodic in hysteria, hypochondriasis, chorea, epilepsy, spermatorrhœa, and in amenorrhœa, given in doses of 1 to 5 grs. in pill.

Damiana is the name given to a drug (*Turnera diffusa* var. *aphrodisiaca*) long used by the Mexicans as a powerful stimulant to the reproductive centres. The leaves and flowers are the parts used in medicine as an aphrodisiac. It has been used in America with success in melancholia and many forms of brain exhaustion, and want of tone in various regions of the nervous system especially about the genito-urinary centres. It is a mild purgative, and has been given in paraplegia with apparent benefit, and in sick headaches. The writer has obtained good results from it in cases of

sexual debility and hypochondriasis. It is a tonic; in its action upon the appetite it resembles quinine and calumba, and it acts also as a stimulating diuretic.

Dose—1 dr. of the fluid extract (1 in 1), or 2 to 8 grs. of the extract.

Dermosapol is a superfatted cod-liver oil soap containing lanoline and Peruvian balsam. It is used as an inunction in scrofulous and tubercular affections, etc. It has a wider range, however, when made the basis of drugs like mercury, iodine, lysol, iodoform, formaldehyde, etc., and dermosapols of these agents are recommended in the diseases in which the crude drugs are indicated.

Dextrose, Grape Sugar, or Glucose, is a white, adhesive, soft, solid, or thick syrupy liquid, prepared by the action of dilute HCl upon starch. Formerly only used as a pill excipient, especially when mixed with 25 per cent. syrup, it has been much used by Barker and others as a nutrient injected before serious operations entailing shock and hæmorrhage. It is supplied in glass tubes, each of which, dissolved in boiled water to form 1 pint, makes a 5 per cent. isotonic solution, which can be injected hypodermically like normal saline solution.

Diaphthol, or Chinaseptol, referred to under the heading Aseptol, is the aseptol of the chinolin series. It occurs in yellowish crystals, very slightly soluble in cold water. Guinard found it to be a powerful antiseptic without any irritating qualities, and he points out its superiority to salol as an agent for disinfecting the urinary tract.

Diaspirin is the succinic ester of salicylic acid—a white crystalline, odourless powder, sparingly soluble in water. It is given in 15 gr. doses as a substitute for aspirin, being more easily tolerated by the stomach. It possesses antirheumatic and antineuralgic properties, being changed in the duodenum into salicylic acid.

Digitalin.—The chemistry of digitalis is still in a most unsatisfactory state, and it is impossible to arrive at a conclusion about the relative values of the substances recommended as substitutes for the crude drug, which contains at least three active glucosides—*i.e.*, Digitoxin, Digitalin, and Digitalein. Digitonin also exists, but it is antagonistic to the others, acting as saponin, and being devoid of cardiac tonic action. There are several substances in use under the name of digitalin, but these are mixtures of the glucosides; the Digitalin Verum of Kiliani is probably the purest one, and it may be given hypodermically in doses of $\frac{1}{2}$ to $\frac{1}{4}$ gr. This is Schmiedeberg's Digitalin under another name. Merck's crystalline Digitoxin is perhaps the most active and reliable of all the substitutes, but it is insoluble in water. It is the glucoside which dominates the action of the others when the crude drug is employed, but it cannot be given hypodermically except when dissolved in Petit's Fluid. By the mouth Merck's digitoxin may be administered in $\frac{1}{4}$ to $\frac{1}{2}$ gr. tablets, each of which may be taken as representing $3\frac{1}{2}$ grs. of the dry leaf, or 1,000 times that of the crude drug. It can be dissolved in spirit before administration.

The Digitaline of Homolle is amorphous digitalin, of variable composition, and should not be used; it is also known as Chloroformic Digitalin, and is supplied in granules $\frac{1}{8}$ gr. each.

Nativelle's Crystalline Digitaline in $\frac{1}{240}$ gr. granules is said to consist of an impure form of Schmiedeberg's digitoxin.

Digitalinum Purum Germanicum may be regarded as a mixture of Kiliani's digitalin, digitalein, and amorphous digitonin. It is given in doses of $\frac{1}{16}$ to $\frac{1}{4}$ gr., and is suitable for hypodermic injection.

Digipuratum has been reported upon recently by Merck. It promises to fulfil all the requirements of a perfect digitalis preparation, being a purified extract from which the 85 per cent. of "ballast" or inert substances found in all digitalis extracts has been removed, and it contains no digitonin. It is, moreover, standardised physiologically, each dose of 5 grs. corresponding to $1\frac{1}{2}$ grs. of the leaf.

Digalen is the name given to a new standardised and purified infusion of digitalis leaf, given in 15 min. doses, which are supposed to contain $\frac{1}{240}$ gr. of digitoxin.

Digitalone is a physiologically standardised digitalis preparation introduced for hypodermic use in the same dose as the B.P. tincture, which can also be injected in emergency. The B.P.C. Succus is given in 5 to 10 min. doses, and the U.S.P. Liquid Extract (1 in 1) in doses of 1 to 2 mins.

Diiodoform, or Ethylene Periodide, is a yellow, insoluble crystalline powder without odour, prepared by the treatment of acetylene iodide with excess of iodine. It contains 95.5 per cent. iodine, and is used as a substitute for iodoform, being similar in action to iodol and aristol. It is easily decomposed by sunlight.

Dionin, or Ethyl-Morphine Hydrochloride, allied to codeine, is introduced as a morphia substitute. It is a soluble crystalline powder, given in doses of $\frac{1}{4}$ to $\frac{3}{4}$ gr., and it is claimed for it that it is superior to morphia in all pulmonary affections, since while it diminishes cough it acts as an expectorant. According to Marshall, it increases the depth and the duration of inspiration, though not so markedly as heroin does. It has also been advocated as a remedy for the morphia habit. A 5 per cent. solution instilled into the eye relieves corneal pain most markedly, but it causes slight smarting at first. Dionin has been useful in severe iritis, and can be used with either atropine or eserine, both of which drugs are intensified in their effects by its addition. It has been suggested as a means of establishing the fact that death has already occurred, as in the living subject dionin instillation always causes redness and turgescence of the conjunctiva, with lachrymosis.

Diplosal, a white, insoluble crystalline powder, is the salicylic ester of salicylic acid, being, therefore, stronger than salicylic acid, 107 parts of the acid being formed in the bowel out of 100 parts of diplosal. Like salol, it passes through the stomach unchanged, but it is claimed for it that it never retards digestion or causes nausea and does not produce sweating. It may be given in acute rheumatism in cachets containing 15 grs. every 4 to 6 hours.

Dithion, the Dithio-salicylate of sodium, is a white crystalline, soluble powder, with yellow tinge, prepared from salicylic acid by the action of sulphur chloride. It is introduced as a substitute for salicylates on account of its small dose—*i.e.*, 3 to 5 grs. It is also a powerful antiseptic.

Diuretin is a sodio-salicylic compound of theobromine, corresponding to the soluble caffeine salts. It is described with its allies Theophylline, Theporin, Agurin, Theocine, etc., under Theobromine.

Duboisia Myoporoides is an Australian solanaceous plant, yielding Duboisine, formerly supposed to be a pure alkaloid, but now regarded as a varying mixture of hyoscyne and hyoscyamine—chiefly the latter—according to the soil and condition of the plant from which it is extracted. The sulphate is used in ophthalmic surgery (1 in 400) as a substitute for atropine, than which it is said to act more promptly. Weber recommends it in wild delirious mania at the onset in doses of 15 to 30 mins. of a 0·2 per cent. solution.

Dymal consists for the greater part of the Salicylate of Didymium. It has been extensively used on the Continent of late years, both in human and veterinary practice. Whilst a 10 per cent. ointment will kill scabies, it may be applied to weeping eczema, seborrhœa, and dermatitis, and as a powder to wounds and ulcers, being powerfully antiseptic.

Eka-Iodoform is a compound of iodoform with 0·5 per cent. of paraformic aldehyde. It is introduced by Schering with the view that the aldehyde being changed at once into formalin vapour, this latter sterilises the iodoform. It is used like iodoform, which it closely resembles in every respect.

Emetine (Methyl-cephæline) is a white, amorphous, pure alkaloid, obtained from ipecacuanha. It acts as a powerful emetic, and should not be given except in very small doses and in diluted condition. 10 grs. hydrochloride of emetine, dissolved in 1 pint Sherry, make Emetine Wine equal in strength to Vin. Ipec. This powerful substance must not be confused with the extractive called Emetin, which can be given in 1 gr. doses. The hydrochloride of Paul's pure emetine has been found to contract the small vessels, and markedly raise the blood pressure. Its emetic dose should not exceed $\frac{1}{6}$ gr.

Cephæline is the name of another alkaloid obtained from ipec., but it is very seldom employed; it is even stronger than emetine in similar dose, but is not so reliable as an expectorant.

Emol is an impalpable powder, something like Fuller's earth, introduced by W. A. Jamieson; it is found in Perthshire. Used with water, it raises a lather like soap, and the powder made into a paste with water has been applied to the palms and soles in keratosis, and covered over with oiled silk. The epidermic masses peel off, leaving healthy skin behind. It does not appear to differ very much from Talc (French Chalk), Dimatos, Kaolin, Cimolite, Kieselguhr, Ceyssatite, Calamina, Fuller's Earth, and the host of other absorbent earth powders in general use. Cataplasma Kaolini is made by saturating heated kaolin with glycerin, after boric acid has been added, and then thymol and oil of peppermint dissolved in methyl salicylate are added (P.B.C. formula). It acts like Antiphlogistine and Thermofuge.

Ephedrine is an alkaloid obtained from *Ephedra vulgaris* or *E. Helvetica*. The hydrochloride is very soluble, and has been introduced as an atropine substitute in 5 per cent. solution to cause dilata-

tion of the pupil. Mixed with 1 per cent. hydrochloride of homatropine, it is employed under the name of "Mydrine," which see.

Epicarin is a yellowish powder with slight odour; it is Beta-oxy-naphthyl-ortho-xyl-meta-toluylic acid. It has been introduced as a remedy for scabies in 10 per cent. ointment, but there are many more certain remedies for this affection. It has, however proved valuable for seborrhœa of the scalp and lichen planus in 5 per cent. alcoholic solution, and a 10 per cent. ointment is a very reliable means of treating chilblains and eczema.

Ergotin is the official synonym for the B.P. soft extract of ergot, but many preparations bearing this name are in use, the best known of these being that of Bonjean, which is given in 2 to 8 gr. doses. Bonjean's purified liquid Ergotin is intended for deep hypodermic injection in doses of 2 to 8 mins.

Wernich's Ergotin is supplied in the dry form—dose 20 grs.—and in the dialysed liquid form—dose 15 to 60 mins.

Yvon's Ergotin is a black fluid given in doses of 16 mins.

Wigger's dried pure Ergotin is a brownish-red soluble powder whose dose is 1 gr.

Bomelon's fluid Ergotin is injected in 3 to 8 min. doses, and his soft extract is given in pills $\frac{1}{30}$ gr.

Keller's Ergotine and Denzel's fluid Ergotine are given in 3 to 8 gr. or min. doses.

Crystallised Ergotinine is an alkaloid in whitish-yellow crystals of very doubtful therapeutic value; the dose is $\frac{1}{100}$ to $\frac{1}{50}$ gr. It forms a soluble Citrate and a Hydrochloride, both given in same dose; the citrate may be injected.

Cornutine is an alkaloidal body of complicated constitution, which Kobert claimed to be the active principle of ergot; it seems almost certain that as such it does not exist in ergot, but is a decomposition product of ergotinine; in any case, it is an active substance, causing uterine contraction, and the Citrate $\frac{1}{10}$ to $\frac{1}{5}$ gr. dose is soluble, and resembles the following in action:

Ergotoxine, Barger and Carr's, forms crystalline hydrochloride, oxalate and phosphate salts; dose— $\frac{1}{100}$ to $\frac{1}{50}$ gr.

As in the case of digitalis, none of the isolated principles produce as reliable effects as an infusion, tincture or liquid extract of the crude drug. (See also Acid. Scleroticum.)

Eriodictyon (*Yerba santa*) is a stimulating expectorant, used in phthisis and bronchitis, from California, and as it contains a resinous principle which stimulates the mucous membrane of the bladder on its elimination by the kidney it is given also in teaspoonful doses in cystitis. It has been used also as a vehicle for quinine (whose bitter taste it effectually disguises), alone or when given with extract of malt (Yerbine). The dose of the Fluid Extract is 10 to 20 mins. The leaves are the part of the plant used in medicine.

Erythrol Tetranitrate (Tetranitrin, Nitro-Erythrite, or Nitrate of Erythrol) has been used as a derivative of erythrite, and belongs to the group of vaso-dilators containing nitrite of amyl and glonoin. 1 gr. may be given every three or six hours in tabloid form; it may be taken in doses as large as 5 grs. five times a day. The value of the drug lies in its being able to ward off the attacks, and by a

judicious use of it these may be prevented entirely. It has no advantage over amyl or glonoin in cutting short the attack if once started. It is expensive, and liable to explode when heated and triturated during its manufacture into tabloids, but when mixed with chocolate, as originally devised by Martindale in the case of trinitrin, it is non-explosive. Its greatest advantage lies in its prolonged action.

Mannitol Hexanitrate, or Hexanitrin, acts also in a similar manner, and in the same doses may be substituted for it. It is not so expensive, but its action is more prolonged, though less effective.

Eucaïne Hydrochloride A is a crystalline synthetic salt introduced as a substitute for cocaine. It is the hydrochloride of Trimethylbenzoxypiperidin (Eucaïne A). It is a local anæsthetic, and may be applied to the throat and nose in 2 to 3 per cent. solutions, which can be sterilised by boiling. It has not proved satisfactory in eye work, as it causes severe smarting. It hardens the tissue and injures the corneal epithelium, but it is less toxic than cocaine, and does not affect the pupil. It is useful in dental work, and may be injected into the tissues round the teeth before extraction. It may be rubbed into the skin before operating in the form of an ointment 10 per cent.

Eucaïne Hydrochloride B is a more satisfactory preparation, and is almost always selected. It is the hydrochloride of Benzoyl-vinyldiacetone-alkamine (Eucaïne B) ; it can be sterilised by boiling without decomposition, and can be injected hypodermically in doses of 3 to 5 grs., and it is less toxic than Eucaïne A. The anæsthesia produced by both substances lasts longer, but is less profound than that produced by cocaine. Eucaïne, owing to its freedom from toxic action, can be employed for local infiltration. Barker used 1 part of eucaïne hydrochloride B, 8 of chloride of sodium, and 1,000 of water, and 2 to 5 ozs. or more of this fluid may be injected into the deeper layers of the skin around tumours, before and during the removal of these, so as to ensure local anæsthesia. More frequently he uses the following : Eucaïne Hyd. (B) 0·2, sodium chloride 0·8, adrenalin chloride 0·001, water 100.

Eucaïne Lactate is more soluble, and is advocated as preferable to the hydrochloride of Eucaïne B.

Eucaïnisation of the spinal cord by the injection of 1 dr. of 1 in 1,000 solution through a lumbar puncture has been repeatedly performed with success to secure spinal anæsthesia before operation, and also for the cure of tetanus and strychnine poisoning.

Eudrenine is the trade name of a concentrated solution, every Pravaz's syringeful (16 mins.) of which contains $\frac{1}{8}$ gr. eucaïne and $\frac{1}{2000}$ gr. adrenalin, ready for hypodermic injection in dentistry, but which should be diluted freely with saline solution for ordinary hypodermic use or for the infiltration method.

Eucalypteol, or Hydrochloride of Eucalyptene, exists as white crystalline scales, obtained from eucalyptus oil, and its action is the same. It is recommended for internal use in preference to the oil, especially for bronchial troubles, phthisis, and typhoid fever in 5 gr. doses in capsule or emulsion, or with sugar ; it may be given wherever the oil is indicated ; or 30 grs. may be given as an enema with olive oil.

Eucalyptol, Cajuputol, or Cineol, is a colourless liquid prepared from the oil of eucalyptus (six different species), being that portion of the oil which passes over between 347° and 351° F. It is used in all the conditions in which eucalyptus oil is indicated. Martindale recommends it for oro-nasal inhalers, because it does not dry up like a varnished coating. It is given internally in capsules containing 5 mins. each, in bronchial affections, cystitis, diarrhœa, asthma, etc.

Eucasin is a tasteless powder like somatose, easily soluble in water or warm soup. It is a compound of ammonia and casein, of considerable nutritive value, and is especially recommended in gout, typhoid fever, phthisis, and chlorosis. It is easily digested, and leaves little residue. Salkowski finds it a suitable substitute for meat albumin, and it leads to a reduction in the excretion of uric acid; 1 to 2 ozs. may be given in soup or cocoa. Weiss states that it contains 95½ per cent. proteid, as against 20½ in beef.

The soluble casein, or milk albumin, known as Plasmon, is a valuable food in an easily digested form. Casumen is a similar preparation. Sanatogen mainly consists of casein in combination with sodium glycerophosphate.

Euchlorine is the name given to a solution of chlorine in water, which is used as a gargle in diphtheria, and as an intestinal antiseptic in typhoid. It is prepared by acting on chlorate of sodium 10 grs. with 30 mins. HCl in an empty corked pint bottle, and then filling up with water in successive quantities till all the chlorine is dissolved.

Eugenol, or Eugenic Acid, is an oily liquid, smelling like cloves, obtained by oxidising oils of cloves, cinnamon, and other oils. It is a powerful antiseptic, and is not toxic; it possesses antipyretic properties, and is a very valuable local anæsthetic in neuralgia and toothache. 15 mins. may be given in wine 3 times a day in phthisis. It takes a place in several Continental pharmacopœias. It has been employed 10 mins. to 1 oz. lanoline in pruritus. The Acetamide is more reliable.

Benzoyl-Eugenol is the benzoic ether of eugenol, and has been employed as a substitute for guaiacol and creosote in similar doses in phthisis, where it is also injected hypodermically in 10 per cent. solution with olive oil. Eugenoform is sodium eugenol carbinol in white crystalline flakes, administered in 10 gr. doses as an intestinal antiseptic.

Euguform is a greenish-white amorphous insoluble powder, introduced as an iodoform substitute. It is Acetylated methylene guaiacol, or Acetyl-methylene-diguaiacol. It is analgesic, and relieves itching, and is useful in acute eczema, ulcers, and herpes.

Eulactol is a food consisting of sugar of milk 3 parts, fat 1 part, and albumin 2 parts. It may be given in teaspoonful doses to infants. It is recommended by Ewald, combined with milk, cocoa, or soups, in cases of faulty nutrition.

Eumydrine is the nitrate of Methyl-atropine—a white powder soluble in water, introduced as a substitute for atropine in ophthalmic practice, as it is less toxic. A 1 per cent. solution causes dilatation of the pupil, which lasts for ten or twelve hours.

Mydrasine is Atropine-methyl bromide—a white crystalline powder, very soluble in water. It has been administered in doses of $\frac{1}{8}$ gr. in the night-sweating of phthisis, in cystitis, and nocturnal incontinence of urine. A 1 to 2 per cent. solution is used as a mydriatic, whose effects are transient.

Eunatrol, or chemically pure Sodium oleate, is a white soluble powder, introduced as a powerful cholagogue and solvent for gall-stones. It is best administered in the form of pills, each containing 5 grs., and 3 or 4 such may be taken twice daily. Cipriani states that upon entering the stomach it is converted into an oily substance which lubricates the duodenum, and the absorbed portion acts as a cholagogue and solvent of the calculi.

Eupatorium Perfoliatum, or Boneset U.S.P.—The dried leaf and flowering tops act as a valuable bitter tonic, like calumba, but it possesses diaphoretic properties. The warm infusion (1 oz. to 1 pint) in wineglassful doses every two hours produces copious sweating; in four times this quantity it is an emetic, like warm chamomile infusion, and also a purgative. It has been used to act upon the skin in bronchial catarrh, influenza, and muscular rheumatism, and its cathartic action has been utilised for the expulsion of tape and round worms.

Euphorbia Pilulifera (Pill-bearing spurge), or Australian snake-root, or Cat's hair, is an asthma remedy. In large doses it paralyses the respiration and heart, through its direct action on the respiratory and cardiac centres. Good results are reported with it in the dyspnoea of asthma, emphysema, bronchitis, and in dyspnoea of cardiac origin. It appears to act beneficially upon spasmodic dyspnoea, from whatever cause arising, probably by its influence over the vagus, but its best effects are seen in ordinary spasmodic asthma; coryza and hay asthma have been markedly benefited by it. The gastric irritation arising from its administration can be avoided by giving the dose in a state of free dilution. 1 gr. of the extract, or 10 to 30 mins. of the B.P.C. tincture, 1 in 5, freely diluted, after meals, may be given 4 times a day.

Euphorin (Phenyl-urethane, or Carbanilic Ether) is an insoluble, colourless, crystalline powder, with a clove-like odour. It has antipyretic, analgesic, antiseptic, and antirheumatic properties like salicylic acid and antifebrin, and has been used in about the same doses as antifebrin (5 grs.) in fevers, neuralgia, migraine, acute rheumatism, sciatica, orchitis and other painful febrile affections. Its antipyretic action is prolonged, and accompanied with profuse perspiration. 5 grs. are about equal in antipyretic effect to 10 grs. of antipyrine. It may be given in tablets or dissolved in wine. The powder is applied to chancres and ulcers, and is much praised in gynecological practice.

Eupthalmin Hydrochloride is a colourless, crystalline, soluble salt, derived from *n*-methyl-vinyl-diacetone-alkamine. A 5 per cent. aqueous solution causes rapid and complete dilatation of the pupil without pain or other drawback, and it is recommended in ophthalmic work in preference to atropine. Its cost is a barrier to its usefulness.

Euporphine is the methyl bromide of apomorphine, introduced as a depressant expectorant, to be used in place of apomorphine in doses of $\frac{1}{12}$ gr. It is claimed that it possesses the specific action of this substance on the bronchial tubes, without acting so strongly on the vomiting centre, stomach, or heart.

Eupyrine (Paraphenetidin - vanillin - ethylcarbonate) exists in greenish-yellow crystals, almost without taste. It is introduced as a safe antipyretic. In doses of 20 grs. it reduces the temperature with certainty, and without producing any unpleasant symptoms, whilst at the same time it acts as a stimulant, and is indicated in feverish conditions where antipyrene and phenacetin are contra-indicated owing to exhaustion or cardiac weakness. It may be given in cachets or placed upon the tongue and washed down with a little water. It has no analgesic action.

Eurobin, or Triacetate of Chrysarobin, is a brown powder, free from the irritant qualities of araroba or chrysarobin, and it does not cause staining. It is used in all the cases where the latter drug is indicated. The Tetra-acetate or Lenirobin is also recommended. They are both soluble in acetone and in chloroform.

Europhen, or Iodide of Isobutylorthocresol, is a yellow bulky powder with a saffron-like odour, insoluble in water, and introduced as an iodoform substitute. It is bland and unirritating, and acts like aristol. It slowly gives off free iodine in contact with moist surfaces. In venereal sores it should replace iodoform entirely. It may be diluted, if necessary, with borax, but not with starch, and 5 per cent. ointments may be used as dressings and applications to moist skin diseases, as intertrigo and impetigo. It contains nearly 30 per cent. of iodine, and does not smell, irritate, or poison, but is easily decomposed by light and heat. It is also administered as a hypodermic injection (15 mins. of a 1 per cent. solution in olive oil) in tuberculosis and in secondary syphilitic affections.

Exalgin, or Methylacetanilide, is a salt occurring in needle-like crystals, which are sparingly soluble in water and easily soluble in dilute alcohol. It is used only for its pain-relieving qualities, in 2 gr. doses in neuralgia, and migraine. It diminishes the amount of urine and of sugar in diabetes, as the other analgesics do, but no benefit follows its prolonged use. The urine has been found to become almost black under its prolonged administration for neuralgia, but no harm resulted. The drug has not gained in favour, and the writer's experience of it is that it sooner requires increase of the dose than the older analgesics, and untoward effects are not rare.

Ferrum.—Notwithstanding the long array of official iron salts and Galenicals, the number of new preparations is almost countless. A few only of those in more common use can be enumerated; these are chiefly organic salts, though it has been many times demonstrated that the organic iron compounds possess no advantage over the official inorganic salts.

Albuminate of iron is the basis of many non-official preparations—Dieterich's *Liquor Ferri Albuminati* is made from dried egg albumin and chloroxide of iron; it contains 0.4 per cent. iron, and may be

taken in $\frac{1}{2}$ oz. doses. There is a commercial albuminate of iron in scale form, containing 5 per cent. ferric oxide, the dose of which is 5 to 10 grs.

Alboferine is the name given to an iron albuminate preparation containing phosphorus in the form of a brown powder, the dose of which is 30 grs.

Ferratin is a reddish-brown powder, consisting of iron (7 per cent.) in combination with albumin. It is prepared from egg albumin and tartarated iron; Schmiedeberg claims that it is a food, and the best form of substance for the administration of iron in 5 to 10 gr. doses.

Alginoid Iron is an insoluble brown powder, consisting of iron in chemical combination with alginic acid obtained from seaweed. It contains 11 per cent. iron, and is given in cachets in 5 to 15 gr. doses, even when gastric disturbances are present.

Ammoniated Arsenio-citrate of Iron is a soluble double salt containing nearly $1\frac{1}{2}$ per cent. arsenious acid and 16 per cent. iron, suitable for hypodermic injection 1 c.c. of a 2.5 solution.

Ammonio-Ferric Alum is described under Alumen.

Bromide of Iron exists in greyish-white deliquescent crystalline masses, the dose of which is 5 to 10 grs., but always given in the form of syrup B.P.C.

Citrate of Iron (U.S.P.) is therapeutically and physically identical with the B.P. double scale salt.

Cacodylate of Iron is a yellow powder, given in 1 to 3 gr. doses where arsenic is indicated. Arsenoferratose is a special liquid preparation containing $\frac{3}{4}$ gr. albuminate of iron and $\frac{1}{150}$ gr. arsenic in each tablespoonful dose.

Dialysed iron was formerly official as a dark brown liquid containing 5 per cent. ferric oxide; it may be given in 30 min. doses with glycerin, and in 1 oz. doses as an antidote to arsenic.

Fluoride of Iron in doses of $\frac{1}{16}$ to $\frac{1}{4}$ gr. is given in pill form in malarial and other enlargements of the spleen.

Hypophosphite of Iron exists in the *ferric* and *ferrous* forms, and these are seldom administered except as syrups, and then usually in combination with other hypophosphites, as in Fellow's syrup, which contains strychnine hypophosphite 0.02 per cent., with 1.4 per cent. hypophosphite of iron, 1 per cent. hypophosphite of quinine and 1.2 per cent. of hypophosphites of potassium, manganese, and calcium.

Iodide of Iron is never given save as the official syrup or as a pill, but the Saccharated Iodide U.S.P. may be given in 10 gr. doses in cachets corresponding to 2 grs. ferrous iodide.

Lactate of Iron exists in pale greenish-white crystalline masses; it is given in doses of 5 to 10 grs. in cachets, or dissolved in syrup of lactophosphate of calcium.

Monse's Salt of Iron (Oxypersulphate) is obtained in scales by evaporating his solution of basic ferric sulphate; the solution is given in 5 min. doses, and the scales in 3 gr. doses as an astringent.

Nucleinate of Iron, or Ferrinol, is also known as Triferrin—a brown amorphous, soluble powder, being a compound of iron with nucleic or nucleinic acid; it contains $2\frac{1}{2}$ per cent. organically combined phosphorus and 22 per cent. iron, and is given in 5 gr. doses.

A liquid syrupy preparation is known as Triferrol, of which the dose is 1 tablespoonful. The Paranucleo-proteid of Iron is known as Fersan ; it also contains some organic phosphorus, and is prepared from red blood corpuscles. It is given in doses of 30 to 60 grs.

Ferratogen is a yellow powder prepared from ferric nuclein, which is obtained by cultivating yeast in the presence of iron.

Oxalate of iron in fine yellow crystals is an insoluble salt administered in 5 gr. pills or cachets, or in solution with a dilute acid.

Peptonate of Iron is procurable in scales by evaporating a solution in which egg albumin has been digested by pepsin and HCl after the addition of iron oxychloride and neutralisation with soda. The liquid peptonate (Dieterich's) is given in 2 to 4 drs., and the scales in 5 to 10 gr. doses. A liquor containing manganese and quinine peptonates in addition is also in use (B.P.C.). Ovoferin—a liquid preparation also known as Iron-Vitellin—has similar organic iron properties.

Phosphate of Iron with its syrup is official, but the compound red syrup, known as Chemical Food or Parrish's Syrup, is much more commonly used in dr. doses, which contain $\frac{1}{2}$ gr. iron phosphate, with $\frac{2}{3}$ gr. calcium and some potash and sodium phosphates.

Parrish's, Fellows', and Easton's Syrup, mixed in equal quantities is known as Triple Syrup.

Pyrophosphate of Iron (Solubilis) occurs in transparent green scales, and may be given in 2 to 5 gr. doses.

Phosphocarnate of Iron is a brown powder, consisting of a compound of iron with phospho-carnic acid obtained from meat extract. It is known as Carniferrin, and is given in doses of 5 to 15 grs. It contains $\frac{1}{3}$ of its weight of iron.

Salicylate of Iron is a reddish-brown powder given in 5 to 10 gr. doses in pill form ; it is also used as a gargle in throat cases for its astringent action.

Somatose (Iron) is a combination of somatose, prepared from fresh meat, and iron ; it is a brown, almost tasteless powder, containing 2 per cent. iron, and may be given in doses of 1 to 3 drs. daily.

Succinate of Iron is a dark red insoluble powder, introduced as a solvent for gall-stones when administered in 3 gr. doses in pill form or in a mixture with 5 min. doses of chloroform.

Valerianate of Iron is a dirty reddish amorphous powder with a disagreeable odour, given in pill form in hysterical conditions in doses of 2 to 5 grs.

Ferri et Magnesii Sulphas and Ferri et Manganis Citras are soluble double salts whose composition is implied in their names ; they are given in 10 gr. doses in solution like the scale preparations.

Ferripyrene, or Ferropyrin, is a dark red soluble powder, containing 12 per cent. of iron and 64 of antipyrine in combination. It has been found a valuable hæmostatic or styptic when applied in 20 per cent. solution. It does not cause any irritation or destruction of tissue, and is a mild anæsthetic. It may be used for the hæmorrhage after tooth extraction, for the nose, middle ear, throat, vagina, or uterus on tampons, and taken internally in chlorosis, gonorrhœa, hæmatemesis, and diarrhœa, in doses of 5 grs. in solution.

For other organic iron preparations, see under Hæmalbumin, Hæmatogen, Hæmoglobin, and Hæmol.

Fibrolysin is the registered commercial name of Merck's preparation, which is a white crystalline powder freely soluble in water. It is a double salt of Thiosinamin and sodium salicylate. Thiosinamin itself is obtained from oil of mustard by the action of ammoniated alcohol; it is also known as Rhodallin, Allyl-Sulpho-Carbamide, and Allyl-Thio-Urea. Fibrolysin is supplied in sterilised ampullæ or glass capsules, containing about 40 mins. of a 15 per cent. solution for one hypodermic dose corresponding to 3 grs. thiosinamin.

The remarkable power of these injections has been established by overwhelming evidence; *the drug causes the absorption of fibrous tissue of pathological formation.* It is injected, not necessarily into the immediate region of the lesion, but better results perhaps occur when injections are made somewhere in its neighbourhood. The range of its usefulness is a wide one; stenosis of the gullet, pylorus, rectum, and urethra has yielded in many cases under injections every two, three, or four days. Many cases of Dupuytren's contraction of the palmar fascia, corneal opacities, the deformities resulting from burns, and all forms of scar tissue, slow resolving pneumonia, cirrhosis of the liver, deafness from middle-ear disease, and fibrous ankylosis of joints have been observed to disappear under its use, though the injections must be kept up for two or three months. The drug also markedly increases leucocytosis.

Tiodine is the name given to the ethyl-iodide of thiosinamin, which contains iodine in organic combination; it has been introduced as an agent for the hypodermic administration of iodine in 2 to 5 gr. doses.

Formalin, Formol, Methanal, or Methyl Aldehyde, is a 40 per cent. solution of formaldehyde or formic aldehyde, which is prepared by the oxidation of methyl. It is found to be one of the most powerful antiseptics known; 1 in 50,000 prevents the growth of bacteria in meat solutions. A 3 per cent. solution will kill all pathogenic organisms in a minute, and is used to sterilise the hands and instruments, though it cannot be satisfactorily used as a disinfectant to wounds, as it possesses a necrotic action. Volatilised by a lamp, or burned in tablets, or sprayed through a sick-room, it is a powerful antiseptic, even in 1 per cent. solution, and this will immediately deodorise fæces and cause no injury to leather or clothes, but it is maintained that it has no penetrating power, and that where there is much dust it is useless. A 40 per cent. solution has been applied to chancres and ringworm of the scalp and to soft corns; a $\frac{1}{2}$ per cent. solution cures gonorrhœa; 2 per cent. glycerin solution is a most efficacious application in all forms of sore throat and stomatitis. The inhalation of formol has been used with good results in tuberculosis, pertussis, and diphtheria. Under the name of Igazol, Cervello has used as an inhalation in phthisis a mixture of formaldehyde, trioxymethylene, and an iodide, and reports most favourably of its effects. Maguire injects in tuberculosis a weak solution of formaldehyde into the veins.

Under the names Holzine, Holzinol, and Sterisol, a 20 per cent. solution is introduced for domestic use as an antiseptic for rooms, utensils, etc. It has been used for the hardening and preservation of specimens and in microscopic work; it preserves the colour of the

specimens in a remarkable way (1 of Formol in 20). Merck has introduced Formaldehyde-Casein, a yellowish-white powder, which is antiseptic, and has been used as a powder and as a gauze for ulcers and wounds. Proteol is also a formaldehyde compound with casein.

Formicin is a thick liquid compound of formaldehyde with acetamide; it is used as an antiseptic 1 in 50 of water.

Citarin is a white soluble amorphous powder, yielding formaldehyde in the system. It is sodium anhydromethylene citrate, and is given in 15 to 30 gr. doses in gout and rheumatism and uric acid concretions.

Indoform is a white powder prepared by acting on acetyl-salicylic acid with formaldehyde; it has been given in 5 to 10 gr. doses in rheumatism.

Lysoform has the widest range of usefulness of all the formaldehyde preparations. It is a soapy liquid described under its own name. (See also Paraform.)

Glutol, or Formacoll, is the name given to a formalin gelatin made by exposing gelatin or isinglass to the fumes of formalin. It becomes hard, and can be easily powdered, when it forms a good dressing for wounds, ulcers, burns, etc.

Amyloform is a compound of starch with formaldehyde used in the same manner as glutol. It is an intestinal disinfectant.

Dextroform is a compound of formaldehyde with dextrin, and has been given internally and used as a 10 to 20 per cent. injection in gonorrhœa. Tannoform, Tannopine, Thymoform, Quinoform, Galloformin, Euformol, Saliformin, Formopyrine, Creoform, Eka-iodoform, etc., are compounds of formaldehyde with the drugs whose names are suggested by their titles.

Formamint is the name given to tablets containing formaldehyde in combination with sugar of milk; they give off formaldehyde in the mouth, and sterilise effectually the saliva.

Formanilid, or Phenyl-Formamide, exists as colourless crystals, obtained by acting on aniline with oxalic acid. It is a powerful analgesic, antipyretic, hæmostatic, and local anæsthetic. It is given in doses of 2 to 5 grs. in neuralgia, etc., and mixed with starch as an insufflation in throat and laryngeal ulcerations, and as a 2 per cent. solution for the urethra before passing instruments.

Fuch sine (Roseine, Aniline Red, Rubine, or Magenta) is the brilliant iridescent crystals of the mono-hydrochloride of rosaniline, recommended by Bouchut as a remedy for albuminuria with œdema. The drug is rapidly passing into disuse; it often contains arsenic; it colours the saliva and the urine red, and can only be given in pill, as its watery solution stains the lips deep red, and it also affects the vision. Reiss affirms that the proper dose is $\frac{1}{4}$ to $\frac{1}{10}$ gr., though others give up to 4 grs. It is used for staining tubercle bacilli.

Fucus Vesiculosus, or Bladder Sea-Wrack, at one time enjoyed a position in the Dublin Pharmacopœia. Its virtues have been chiefly found useful in scrofula, various glandular and joint enlargements, and bronchocele. D.-Duparc used it in psoriasis, and discovered that it caused the absorption of adipose tissue. It is a popular remedy for obesity, and is the basis of the majority of nostrums exploited for this purpose. Some believe it causes emaciation by

the amount of iodides which it contains, but iodine or iodides will not produce the results claimed for this wrack; others believe it to be uncertain or powerless, and it is a rather significant fact that the pig, which is regarded as closely allied to man in some physiological and structural points, has been fattened for market on the fucus vesiculosus in the North of Ireland.

5 to 10 grs. of extract, or 1 to 2 drs. of the fluid extract, may be given 3 times a day.

Fuller's Earth.—A clay or native silicate of alumina, contains minute quantities of iron and magnesia. In the form of impalpable powder, it is a valuable emollient and "drying" remedy in weeping eczema, and especially in the intertrigo of infants. It resembles the oxide of zinc in its properties. (See under Emol for similar drugs.) Wescott points out the danger of tetanus arising from the application of this dusting powder to broken surfaces.

Galium Aparine, or Cleavers or Goose Grass, is a succulent annual plant which has been a domestic remedy for various strumous disorders, and the juice has been applied to disperse glandular growths, and to stop hæmorrhages. Dr. Boyce testifies to its value as a palliative in cancer. He gives 5 ozs. of the juice daily, and applies a strong ointment to the ulcerated surface, which he afterwards covers over with a dressing of the bruised leaves. Winn has found it to cure psoriasis after all other remedies failed, and Ogle recommends its administration in epilepsy. It is also given in cystitis.

Gallanol or Gallol (Gallic Acid Anilide) exists in colourless, sparingly soluble crystals. It is introduced as a substitute for chrysarobin in psoriasis, applied as a paste with traumaticine, mixed with inert powders dusted on eczemas or applied as a 1 in 5 ointment. It has also been used in ringworm. It is non-irritating and non-poisonous, and is recommended when the face is affected, as it reduces hyperæmia without staining.

Gallobromol, or Dibromogallic Acid, exists in white crystalline needles, soluble in 10 parts water; it is recommended as a substitute for the ordinary bromides in the usual doses. It is a powerful antiseptic, and has many advocates as an injection (2 per cent.) in gonorrhœa and cystitis. It is claimed for it that it prevents chordee. The injection should be prepared fresh.

Gaultheriæ Oleum.—The fragrant oil of winter-green consists of salicylate of methyl to the extent of 99 per cent. The oil of sweet birch (*Betula lenta*) is practically identical. It has been administered as an antipyretic in acute rheumatism, in which disease its effects are identical with those produced by salicylic acid. It has a pleasant taste, and may be given in doses of 15 mins. in emulsion or capsule every 3 or 4 hours. It is also applied externally in rheumatic joint affections. Methyl Salicylate, prepared synthetically, is in all respects identical with oil of winter-green, and may be substituted for it. Martindale's Methysal Balm is an antiseptic ointment of methyl salicylate with menthol and lanolin as a basis: it is recommended for muscular rheumatism and pruritus. Mesotan is the Methoxymethyl ester of salicylic acid in the form of a yellow oily liquid, which, diluted with an equal amount of olive oil, has proved useful in the relief of rheumatic troubles, but it is liable to

cause a spreading dermatitis after a time. Ulmarene is a similar liquid. Amyl Salicylate is a colourless liquid introduced as a substitute for Methyl Salicylate, and Ethyl Salicylate has been introduced for hypodermic use. Methyl-acetyl-salicylate is a white crystalline powder introduced as a substitute for salicylic acid in acute rheumatism ; its accurate dosage has not been determined.

Gelatins.—Medicated gelatins are used by Unna instead of greasy ointments ; his Zinc Paste consists of a firm elastic gelatin preparation containing gelatin 4, water 16, glycerin 12, and zinc oxide 6 parts. This is prepared by heating, and becomes a white solid like vulcanised indiarubber. It keeps in the solid form till required for use, when it can be easily melted by heat and applied to the limb with a brush ; over it is applied a gauze bandage, which receives another coating, and one or more layers of bandage are then put on, each receiving its coat of gelatin, till a firm elastic covering is applied to the entire limb. He claims for this that it can be worn for two months, and is far superior to the rubber bandage. If an ulcer be present, it is dressed before applying the gelatin, and afterwards, when its discharge soaks through the coating, a little window is cut, which permits of its inspection, and the application of suitable remedies. He makes a soft basis of gelatin 3, oxide of zinc 3, glycerin 5, and water 9 parts, which may be used in all cutaneous inflammations, prurigo, eczema, acne, etc., and to it substances like resorcin (2 per cent.), ichthyol (2 per cent.), chrysarobin (5 to 10 per cent.), iodoform and sulphur (25 per cent.), may be added ; it is known as Zinc Varnish.

Pick dissolves clean white commercial gelatin in double its weight of water on a water-bath. The resulting solution brushed over the skin forms a protective coating, and has been used to form a basis for the application of chrysarobin, naphthol, iodoform, pyrogallac acid, and other active ingredients. Thus, for psoriasis, about 35 grs. of chrysarobin are added to 1 oz. of the hot gelatin solution, and stirred till thoroughly mixed. This when cold makes a cake which can be afterwards melted and applied with a brush to the diseased spots. The Sublimate gelatin used in the treatment of scaly eczema and other skin affections is an elegant and efficient agent. It is prepared by dissolving in a water-bath with water 30 parts of pure gelatin, and evaporating the mixture till its weight falls to 75 parts, at which point 25 parts glycerin and 0.05 perchloride of mercury are to be added.

Formalised Gelatin is used in a similar manner as a substitute for collodion. It consists of a 1 in 10 aqueous sterilised solution of gelatin, and 1 in 100 pure formic aldehyde.

Gelanthum is a new gelatin or ointment basis introduced by Unna as a varnish dressing, and made of gelatin, gum acacia, and tragacanth, with glycerin and thymol. Ichthyol, resorcin, and other bodies can be suspended in it.

Bassorin Paste is a basis made by dissolving tragacanth 5 in glycerin 2, alcohol (96 per cent.) 10, and water 83. It is known as Linimentum Exsiccans. A similar basis is used like the medicated gelatins for active skin remedies. Glucantha is only used as a pill excipient, and consists of 240 grs. tragacanth, $\frac{1}{2}$ oz. water, and 2 ozs. syrup of glucose. For the use of gelatin as a remedy for hæmorrhage, see under Gelatin (p. 386).

Geranium Maculatum, or Cranesbill.—The rhizome is an astringent containing tannin. It is used in America in the diarrhœa of children, and may be given in every condition in which catechu or kino is employed, and as a local astringent in hæmorrhoids, rectal fissure, and in gleet. The dose of the liquid extract (1 in 1) is 30 mins., of Geranium, its dried extract, 2 to 5 grs.

Gland Substances.—Organotherapy has of late years attracted much attention since the establishment of Brown-Séquard's view of the internal secretion of glands playing an important part in influencing the cells of the body. The action of the active principles of the thyroid and suprarenal glands in combating diseased processes holds out a hope that similar remarkable achievements may be demonstrated in the near future, though the empiric and often unscientific use of crude organic products is apparently retarding rather than hastening this desideratum.

Under **Brain Substance** the effects of cerebrin have been already referred to.

Dried Bronchial Gland Substance (Glandulen), obtained from sheep, has been employed in 2 gr. doses on the theory that these organs possess the power of resisting the attacks of the tubercle bacillus, but no evidence of its efficacy has ever been forthcoming, and the same must be said of—

Mesenteric Gland Substance.—The writer has satisfied himself by injection experiments on living guinea-pigs that the resistance exercised by these glands is a purely mechanical one, the fine reticulum of the gland structure acting as a filtering barrier, and hence any specific effect based upon the theory of an internal secretion must prove illusory.

Dried Lung Substance (Pulmones Sicca) appears to be a still less rational mode of treatment. It was introduced by Brunet for all chronic lung diseases, including phthisis.

Duodenal Membrane in the dried form, and as a liquid extract known as Secretin, has been introduced as a remedy for diabetes. The normal duodenum secretes a substance—prosecretin—which, on the addition of HCl, becomes changed into secretin. This latter substance powerfully stimulates the pancreas to manufacture its internal and its external secretion. The dried preparation is given in 5 gr. tablets, and the liquor in 1 to 4 dr. doses, according to the strength of the preparation.

Mammary Gland Substance, from the dried udder of the cow, has been tried in various uterine affections in doses of 10 grs. *ter in die*, but like most of the present list of gland substances it is improbable that it is of much value, though some reporters state that it cures uterine fibroids and relieves dysmenorrhœa and menorrhagia.

Ovarian Substance seems to have some future before it. In 5 to 10 gr. doses of the dried gland many observers have reported relief to the distressing symptoms which have appeared after removal of the ovaries, and about the climacteric period, in amenorrhœa, chlorosis, epilepsy, many skin diseases, Graves' disease, acne, neurasthenia, and a host of neurotic conditions accompanying disordered menstruation. The writer tried it in one case where a patient, otherwise healthy, had only menstruated a few times in 10 years; the flow appeared in a week after the use of the ovarian drug, and

continued with considerable regularity, but the result may have been a mere coincident. There cannot be a doubt, however, that many of the disturbances associated with the climacteric period are markedly relieved by this agent. Friedmann states that he ensured or determined the sex in the case of guinea-pigs, as he succeeded in producing a male animal by the internal administration of ovarian substance, and a female by injecting spermine after conception had occurred. Even Uterine Substance has been given in menstrual disorders and in puerperal mania, but with negative results, and recently Placental Tissue is urged as a remedy for puerperal sub-involution and anæmia. Placentine—a liquid extract—has powerful influence in raising the blood pressure.

Corpora Lutea, from the ovary of the cow, has been given in the dried state for disorders occurring during pregnancy, as vomiting, nausea, flushing, etc.

Pineal and Pituitary Gland Substances have also been tried in 2 gr. doses in various brain and nerve diseases; the latter substance (Hypophysis cerebri sic.) has been vaunted in acromegaly, but it appears not to have any action in the disease, though early reports state that the symptoms improved. It, however, relieves the headache sometimes most markedly. The infundibular portion of the gland contains two substances, according to Schäfer, one of which raises while the other depresses the blood pressure. This may account for its tonic action on the heart, in which it resembles thyroid extract and the suprarenal gland.

Prostate Gland Substance in 2 to 5 gr. doses has been tried in enlargement of the organ, and in atrophy of the testicles and in senility, but the results are not encouraging. Late reports, however, from several sources show amelioration of all the bladder symptoms in simple hypertrophy of the gland when prostate feeding has been resorted to.

Parotid Substance is suggested in various forms of ovarian disease; and Bell states that in sixty cases of ovarian enlargement and pain treated by parotid tabloids he was able to effect a complete cure without operative interference. Parotid gland extract, prepared by Merck, has been given in uterine and ovarian disease in 5 gr. tabloids with reputed success.

Thymus Gland Substance is used in exophthalmic goitre; and in 5 gr. doses thrice daily the writer has seen benefit from it in this disease, which is always made worse by the administration of thyroid gland. It is also recommended in rickets and in cases of defective nutrition in children, and in pseudohypertrophic paralysis; but to be of use it must be given in doses of 20 to 30 grs. of the dried substance *ter in die*.

Dried Liver (Hepar Siccum) has been reported as useful in diabetes and in cirrhosis of the liver with ascites, and in jaundice and hæmorrhage from the lungs. Merck points out that the liver is the only animal organ whose activity is not altered by heating; hence the freshly-cooked gland may be tried instead of the dried substance.

Liver has the power of removing hemeralopia, but must be taken for this purpose in daily doses of about 8 ozs. Whether the substance acts by regenerating the visual pigment or by correcting some functional disturbance due to hepatic insufficiency is a disputed question.

Extracts of Ciliary Body and Vitreous Humour and Retina have been employed internally, subconjunctivally, and by instillation in atrophy and detachment of the retina and sympathetic ophthalmia. The retinal extract is known as Opticine.

Spleen Pulp (*Lien Siccus*) has been introduced by Maragliano in anæmia and chlorosis; he administered the fresh pulp in daily dose of 4 ozs. in emulsion. Constein's Eurythrol is a liquid extract of spleen. The dried substance is vaunted as a specific in malaria equal to quinine 5 grs. every 3 hours; it increases leucocytosis, and has been administered in typhoid fever and tuberculosis. It has been recommended in Graves' disease and various forms of insanity, and in cases of removal of the spleen.

Kidney Substance (*Renes Sicca*) has been administered in 15 gr. doses in uræmia and albuminuria, but with very doubtful benefit.

Leech Extract, made from the head of *hirudo*, possesses the remarkable property of preventing the coagulability of the blood. Merck supplies sterilised *Extractum Sanguisugæ Siccum* (1½ gr. doses) for addition to blood used in transfusion to prevent or retard thrombosis. The extract is a powerful stimulant to the phagocytes, and has been suggested as an immunising agent in infections.

Marrubin (*Medulla Ossium Rubra*).—Red marrow of bone from the ribs and vertebræ of sheep and cows has been given in tablet form in anæmia, leukæmia, rickets, purpura, lymphadenoma, osteomalacia, etc. The best preparation is Marrubin, which is a glycerin extract given in 1 to 2 dr. doses, and sometimes proves successful in the treatment of pernicious anæmia. Virol and Myelocene are also red marrow preparations. Yellow marrow has been given in skin diseases, and good results are reported in chronic dermatitis, where it has been used as a food, given fresh, in tablespoonful doses.

Testicular Extract (*Testes Sicca*) is referred to under Spermine, and Suprarenal Gland, under its own name.

Gluton is the name given to a whitish soluble powder prepared by acting on gelatin by acids. It is a valuable nutrient, and may be taken in the form of a liquid with sugar and lemon juice as a food. It is claimed for it by Brat that it can replace albuminous foods, may be taken in any amount, and that it is easily digested and has the same nutritive value as gelatin. It is not to be confounded with Glutol, which is formalin gelatin, or with Glutin—the diabetic food-stuff obtained in the manufacture of starch.

Glycogenal is a white, odourless, tasteless powder, known as Rörig's Glycogen, and is closely related, according to Merck, with glycogen, and is found in considerable quantities in the healthy body, but disappears in diseased conditions, notably in phthisis, and hence its use as a restorative in this disease. It is bactericidal, and has an extraordinary power of increasing the appetite, and it can be given in large quantities (1½ ozs.) daily without harm. The drug is given in 20 gr. doses with 1 gr. carbonate of ammonia before breakfast. It is also given hypodermically and per rectum, but the ordinary method by the mouth seems to meet all cases. Rörig regards it as an antitoxin in scarlatina, and reports glowingly of it in a host of diseases, as migraine, exophthalmic goitre, cancer, abscesses, etc.

Glyconin is the name given to a mixture of nearly equal parts of egg yolk and glycerin (45 and 55) rubbed up together. It is used as a dressing for ulcers, burns, bed-sores, and fissured nipples. Glyco-gelatin is a basis for lozenges used at the Throat Hospital, consisting of a solution of gelatin in glycerin and aq. flor. aurant. tinged with carmine. Gelato-glycerin is a firmer basis used for bougies. Glycero-alcohol (Petit's Liquor) is a liquid containing 33 per cent. glycerin in alcohol and water, used as a French solvent for most alkaloids. Glycetracts is the name given to the group of glycerin extracts (1 in 1) of vegetable substances, and Martindale uses the term "Glycopasta" to designate the preparation of stiff consistence which results when these are converted into a paste for local application by adding 2 to 3 per cent. tragacanth.

Glycosal (Mono-salicylic-acid-glycerin ester) is a white crystalline powder, introduced as a substitute for the ordinary salicylates in rheumatism, neuralgia, and all painful rheumatic conditions which are benefited by salol. It is less irritating to the stomach and less likely to cause ringing in the ears, etc. A 20 per cent. alcoholic solution brushed over the skin is rapidly absorbed, and it is suggested that the drug may be freely given in this way, and also per rectum. The dose is 10 to 30 grs. of glycosal three times a day, and it is only very sparingly soluble in water.

Spirosal is an allied ester, being the glycolic monosalicylate. It has been demonstrated that it is superior to glycosal, inasmuch as it is more readily administered by the skin in muscular rheumatism, and is free from odour and irritating qualities. 1 dr. may be rubbed into the skin over the painful spots, which are then covered with flannel or cotton-wool; it is very quickly absorbed.

Gossypium Herbaceum.—Cotton-root bark has been extensively used in America as a substitute for ergot. Prochownick recommends a fresh infusion in uterine hæmorrhage caused by abortion, or by fibroid tumours. Drachm doses of the liquid extract may be given in dysmenorrhœa and amenorrhœa. Some authorities deny its usefulness entirely. (See Colonial Addendum.)

Grindelia.—The dried herbs *G. robusta* and *G. squarrosa* are used as asthma remedies. They act like lobelia, and prevent or control spasm of the bronchial tubes, and at the same time act as expectorants and slow the pulse-rate. The leaves are mixed with nitre and burned as a powder or cigarette like stramonium in all forms of asthma, and are given internally at the same time (20 mins. of the 1 in 1 fluid extract). The drug is extolled in America for a host of ailments. (See Colonial Addendum.)

Guæthol, or Ajacol, or Thanatol, is an oily liquid, being Pyrocatechin-mono-ethyl-ester. It is the ethyl compound corresponding to guaiacol. It is introduced as a substitute for guaiacol when given internally in 4 min. doses in capsules 4 times a day in phthisis, or painted over the skin with the intention of reducing fever or of being absorbed, or of relieving pain in neuralgia.

Guaiacol is a colourless liquid introduced for the treatment of phthisis. It is the active constituent of creosote, and exists in beechwood creosote to the extent of 60 to 90 per cent. It is the methyl

ether of catechol or pyrocatechin, and is prepared synthetically in the pure state in crystals. It possesses powerful lethal action over the bacilli of tubercle, even when in exceedingly weak solutions. Under its use the constitutional symptoms of phthisis or tuberculosis diminish—cough, sweating, fever, chills, anorexia, thirst, etc. It is believed to enter into combination with the chemical virus produced by the tubercle bacilli and thus to destroy its action. Its effects are identical with creosote in the same doses, but it is less irritating to the stomach. It can be given in cod-liver oil or in solution—1 dr. with 2 ozs. tincture of orange, and 2 ozs. glycerin, and water to 10 ozs. Dose—1 dessertspoonful; but the capsule form is decidedly preferable. It may be used in carrying out the intensive method of treating phthisis with creosote, and 15 mins. three times a day have been given without bad results.

The drug possesses two other marked actions—painted upon the skin with a brush and covered over with oiled silk it reduces the temperature in fevers. This method is now abandoned owing to the dangerous collapse following its application. 15 to 30 mins. were used in this way, and more than half of the dose by the skin can be recovered in the urine. It is also powerfully anæsthetic, and may be painted or injected over neuralgic nerves with great benefit, and chloroform can be injected with it in sciatica with advantage. It is injected (5 per cent.) dissolved in sterilised olive oil alone or with 1 per cent. iodoform in phthisis.

Bocchi obtained excellent results by smearing a 1 in 10 ointment over the scrotum in gonorrhœal epididymitis.

Guaiacol Carbonate, or Duotal, is a colourless crystalline powder, used as a substitute for guaiacol owing to its tastelessness and un-irritating qualities. It is insoluble in water, and may be given in 5 to 15 gr. doses four times daily in sugar or wafers. It contains 91·5 per cent. of pure guaiacol. The Benzoate or Benzozol is described under its own name.

Calcium Ortho-guaiacol Sulphite, known as Guaiacyl, is used as a local anæsthetic in 1 in 10 of water.

Guaiacol Chloroform is a solution of 12 parts guaiacol in 20 of chloroform; 10 to 15 mins. may be injected in sciatica and other painful conditions instead of morphine.

Guaiacol Cinnamate, or Styracol, in crystalline needles, is the cinnamic acid ester. It is given in every case where creosote is indicated, and has been used in cystitis and gonorrhœa in doses of 5 to 10 gr. cachets or capsules thrice daily. It passes unaltered through the stomach, and has been advocated in abdominal tuberculosis.

Guaiacol Phosphate and Phosphate are white crystalline powders given in 3 gr. doses; they have similar actions to guaiacol.

Guaiacetin (Sodium Pyrocatechin-monoacetate) is a crystalline powder, recommended in 5 to 8 gr. doses by Strauss as a substitute for guaiacol.

Guaiacol Iodoform is made by dissolving 1 part of iodoform in 5 of guaiacol. It is used as a remedy injected into lupoid patches.

Iodocol is the name given to a compound of iodine and guaiacol, given by Catanni in 5 gr. doses in phthisis.

Guaiacol Salol, or G. Salicylate, is used in 15 gr. doses in tubercle, and as an intestinal disinfectant.

Guaiacolate of Piperidine, or Guaiperol, is a crystalline salt used for tuberculosis in doses of 5 to 30 grs. (10 grs. dissolve in 1 oz. water). It is split up in the intestine into guaiacol and piperidine, and does not disturb the stomach.

Guaiacol-potassium-sulphonate, or Thiocol, exists in white soluble odourless crystals, which have been given in phthisis and tuberculosis in doses of 10 to 20 grs. or more four times a day.

Guaiacol Valerianate is known as Geosote. It is a yellow oily liquid, lauded by Rieck as the most valuable of the guaiacol compounds in phthisis, and locally in lupus and diseased joints or bones. 3 to 8 mins. may be given in capsule three times a day.

Guaiaform, or Geoform, is a brownish powder prepared by the action of formic aldehyde upon guaiacol. It forms with tannic acid the compound known as Tannoguaiaform.

Guaiasanol is the hydrochloride of diethyl-glycocol-guaiacol in white soluble crystals. It is claimed for it that it is the only soluble guaiacol preparation giving off guaiacol in the body, and that it is practically innocuous, and may be given in doses up to 3 drs. daily to saturate the system in tuberculosis. It is a powerful antiseptic and deodoriser.

Guaicamphol is the camphoric ester of guaiacol—a white, tasteless, insoluble powder, which changes in the duodenum into camphoric acid and guaiacol. It is used by Lasker in the night sweats of phthisis with success in 5 gr. doses before bedtime.

Guaiamar is guaiacol-glycerol ester, a white bitter powder, given in 5 to 15 gr. doses in phthisis. An ointment (1 in 4) is used as an anodyne application to rheumatic joints.

Guarana is a dried paste, in hard sticks, of a chocolate colour, prepared from the ground roasted seeds of *Paullinia sorbilis*, a climbing, shrubby vine from Brazil. The alkaloid Guaranine, of which it contains 3 to 5 per cent., is identical with caffeine and theine, and is useful in sick headache in similar doses—1 to 5 grs. The dose of guarana is 10 to 40 grs.

Gurjun Balsam, or Balsam Dipterocarpi, or Wood Oil, has been used in India as a substitute for copaiba, to which it bears a strong resemblance, but is inferior in every respect as a diuretic. In 1 dr. doses it is a reliable but nauseous expectorant. Good results have followed its use in leprosy, when used as a local application, and given internally in 2 dr. doses at the same time, in emulsion 1 part, with 3 of lime water.

Hæmalbumin, introduced by Dahmen, is a stable brown powder, soluble in warm water; it contains all the salts and albuminoids of the blood except fibrin. It is claimed for it all the virtues generally attributed to every organic iron preparation before falling into disuse. It is given in 30 gr. doses *ter die* in all states where iron is indicated.

Hæmatogen, introduced by Hommel, consists of the defibrinated blood of oxen, with Malaga wine and glycerin, containing all the albuminous constituents of the serum of blood and all the blood salts, as well as pure hæmoglobin, in an unpeptonised state, but it is improbable that it is identical with the hæmatogen of egg yolk. It

is given in anæmia in 2 to 4 dr. doses. Sicco is the name given to dry hæmatogen, which is a brown, soluble, odourless, tasteless powder, given in 30 gr. doses.

Hæmoglobin, extracted from the blood of the ox, is administered by Ziemssen in the form of a large pill or bolus coated over with chocolate, and weighing over $\frac{1}{2}$ dr. Two such pills are given three times a day, with good results in chlorosis. The actual amount of iron in each pill or "ball" does not exceed $\frac{1}{45}$ gr. Dried defibrinated ox blood can be obtained; it is, however, only suitable for enemata.

Ox-Serum is used by Grunbaum, who gives it by rectal injections as a method of feeding where the stomach is not available. He gives 3 ozs. every 4 hours. It has been injected with success in chorea.

Hæmol and **Hæmogallol** are two brownish, tasteless powders, obtained by reducing agents from ox blood. They are given in doses of 5 grs. in tablets, and marvellous results are attributed to them in anæmia, though Stockman, our best authority on the pharmacology of iron, could see no benefit from them in chlorosis. His experience is supported by the statement of Mercadante that hæmol has no blood-forming properties unless it is chemically combined with a heavy metal. The introduction of a long list of elements, in combination with hæmol, has materially extended the materia medica. Thus there are Bromohæmol (which see), Cuprohæmol, Iodohæmol, Ferrohæmol, Mercurio-iodised hæmol, Zinchæmol, Arseniohæmol, and several others which are of therapeutic value; but the list of organic iron preparations is bewildering, and there is little positive evidence that any of them are superior to the old inorganic salts of recognised value. The mercurio-iodised preparation is stated to contain 28 per cent. of iodine and 13 per cent. Hg., and there are glowing reports of its virtues in advanced syphilis in doses of $1\frac{1}{2}$ to 5 grs. in pills.

Helenin is a stearoptene in colourless acicular crystals from *Inula Helenium* (Elecampane), used in phthisis, broncho-pneumonia, pertussis, and enteric affections. It is a more powerful antiseptic than boracic, salicylic, or carbolic acid, and is unirritating. It destroys the bacilli of tubercle, cholera, and diphtheria, and has been given in doses of 1 to 2 grs. in these affections and in diarrhœa. Helenin is not to be confounded with Helalin, a liquid preparation of collinsonia combined with cascara and pepsin.

Alantol, a liquid distilled from elecampane, has been administered in doses of $\frac{1}{4}$ min. in phthisis with benefit.

Helleborein is a glucoside existing in the Christmas rose—*Helleborus niger*. Venturini found that $\frac{1}{100}$ gr. in solution dropped on the conjunctiva produced a complete anæsthesia of the cornea, lasting for $\frac{1}{2}$ to 1 hour, without in any way interfering with the intra-ocular pressure.

It must not be confounded with the narcotico-acrid glucoside, Helleborin, derived from the same plant.

Heroin Hydrochloride, or Diacetyl Morphine Hydrochloride, is a white crystalline powder soluble in water. It is claimed for it that its dose is smaller than that of morphine, and that it does not cause constipation, and that it acts more strongly upon the respiration

than upon the cerebrum, and that by increasing the depth of the respirations it interferes little with the gas exchange. These properties are very desirable in a drug for the treatment of the cough of phthisis and bronchial irritations and of pertussis. It also lowers the temperature. The dose is $\frac{1}{12}$ to $\frac{1}{6}$ gr., and it can be given hypodermically. Intralaryngeal injections (2 mins. of 5 per cent. solution) relieve the pain of laryngeal tubercular ulceration for several hours. Like its rival, dionin, it is vaunted as a remedy for the treatment of the opium habit. But a study of the literature of heroin shows that it is a drug only to be used with great caution.

A glycerin preparation is in use under the name of Glycaphorm, each dr. of which contains $\frac{1}{48}$ gr. heroin. The name Glyco-Heroin is given to a popular cough medicine containing the drug.

Holocaine is the hydrochloride of Para-diethoxyethenyl-diphenyl-amidine occurring in colourless crystals. It is prepared synthetically as a cocaine substitute, and a 1 per cent. solution of the hydrochloride is twice as effective as the same strength of cocaine solution, and causes anæsthesia of the conjunctiva in 15 seconds. It does not affect pupil, accommodation, or circulation, but it is toxic like strychnine, and cannot be injected or used in strong solution.

Hydrargyrum.—In addition to the official salts and mercurial preparations, a host of combinations of mercury have been introduced, many of which are in frequent use; the majority of these, as in the case also of iron, are organic compounds of the metal. The following may be mentioned:

Hydrargyri Benzoas was introduced as an agent for hypodermic injection, but it is almost insoluble in water, and can only be satisfactorily employed hypodermically when dissolved with five times its weight of ammonium benzoate in water. It exists as a white crystalline powder, the dose of which is $\frac{1}{20}$ gr.

Hydrargyri Bromidum, like the previous compound, is a mercuric salt, but more soluble in water (2 grs. in 1 oz.). An average dose is $\frac{1}{8}$ gr., which can be given hypodermically, lodged deep in the muscles of the buttock when dissolved in less than its own weight of sodium bromide and 15 to 30 mins. water.

Hydrargyri Carbolas (Mercury Phenol), prepared by precipitating a solution of perchloride with carbolate of potash, is a white, tasteless powder, given in doses of $\frac{1}{2}$ gr. four times daily in syphilis. It is especially indicated in syphilitic psoriasis and in tubercular and macular eruptions.

Hydrargyri Cyanidum is a powerful antiseptic praised in ophthalmic surgery. Sicherer uses a 1 in 500 solution in ophthalmia neonatorum, and 1 in 100 solution in ordinary ophthalmia, and it is given internally in doses of $\frac{1}{8}$ gr. in syphilis, injected in 1 per cent. solution; and in 1 in 4,000 solution has been successfully injected into the urethra in gonorrhœa. The Oxycyanide is scarcely less poisonous than the cyanide; it is, however, a better agent for the sterilisation of instruments. Both salts should be used with caution, though they have been strongly recommended for intravenous injection in severe forms of syphilis, 20 mins. of a 1 per cent. solution being injected daily. Lister used a dressing of the double cyanide of mercury and zinc. Gauze impregnated with it has been prized by

surgeons as a powerful unirritating application to fresh wounds. It contains 3 per cent. by weight of the salt, and is tinted with rosaniline; before application it is moistened with ordinary carbolic lotion.

Hydrargyri Formamidum.—The formamide of mercury is recommended for injection. It does not precipitate albumin or cause any irritation of the subcutaneous connective tissue. A Pravaz syringe-ful of a 1 per cent. aqueous solution of the hydrargyri oxidum cum formamido is injected two or three times a day, but the method has not gained in favour.

Hydrargyri Gallas is a dull green powder, insoluble in water, and preferred to the tannate as being more stable. It is given in doses of $\frac{1}{2}$ gr. in pill form in syphilis.

Hydrargyri Injectio Hypodermica.—Many preparations are extolled; the majority, if not all, of these should be injected deeply into the muscles. Scarenzio prefers the hypodermic administration of calomel in suspension; it may be given in $\frac{1}{2}$ gr. doses suspended in sterilised olive oil. It is claimed for the calomel that only 4 injections of 40 centigrammes in all is enough for ordinary cases of syphilis. Fournier uses *sublimed* calomel washed in boiling alcohol and dried and mixed with sterilised olive oil. $\frac{5}{16}$ gr. in 17 mins. of oil is given in each injection deep into the buttock, every 7 days, for four or six times, and he reports very striking success. The hypsulphite of mercury and potassium makes a hypodermic solution which does not cause pain, but it decomposes, and must be made fresh daily, and hence should be discarded.

Bloxam uses Sal Alembroth (Ammonio-Mercuric Chloride); he injects deeply 10 mins. of a 5 per cent. solution once a week till mercurialism occurs, then once a fortnight, and finally once a month for 18 to 23 months, the total quantity of mercury only amounting to 6 or 8 grs. during the entire treatment. Galliot, in 4,000 injections of $1\frac{1}{2}$ grs. yellow oxide in 15 mins. of vaseline oil, had no accidents. Many surgeons use "Grey Oil," for which there are numerous formulæ. The best consists of a weak lanoline ointment of mercury, rubbed up with olive oil and made to contain 10 per cent. mercury, the dose of which is 10 mins. Leloir's grey oil contains 80 parts oil of vaseline, 10 of ethereal tincture of benzoin, and 40 pure mercury.

Lambkin's Creocamph or Mercurial Cream is a 1 in 10 emulsion of mercury in a fatty basis, prepared from palm oil, with creosote and camphoric acid. Dose—10 mins.

Colloid Mercury, or Hyrgol, has been vaunted, but it causes pain at the puncture. The Red Iodide dissolved in sodium iodide is injected by Ragazzoni 1 gr. in 1 dr. of water with q.s. sodium salt; dose—5 mins.; Cypridol, or Hydriodol, which is 1 per cent. of this salt in olive oil, is also recommended.

Hermophenyl (Mercurio-sodic phenol-disulphonate) is a white powder, soluble in water, and containing 40 per cent. mercury. $\frac{1}{4}$ gr. may be given by deep injection dissolved in 1 dr. water, as it causes little pain and never suppuration. The Glutinopeptonate introduced by Hufler occurs in scales soluble in water. 4 grms. dissolved in 100 c.c. water make a 1 per cent. solution (Hg), of which 15 mins. is the dose. The Iodo-cacodylate is also used for injection in doses of $\frac{1}{2}$ gr. of the salt dissolved in 15 mins. water.

Hydrargyri Oxidum C. Asparagin consists of a solution of 1 gr. mercuric oxide in 100 mins. of saturated solution of asparagin, of which 15 mins. may be injected. **Hydrargyri Amido-acetas**, or mercury glycocoll, is made by dissolving mercuric oxide in glycocoll, and it may be injected in doses of $\frac{1}{6}$ to $\frac{1}{4}$ gr.

Other solutions for hypodermic use are made from the lactate, bromide, cyanides, sozoiodol, succinamide, formamide, etc., whilst emulsions of the salicylate, tannate, thymol acetate, yellow oxide, etc., are also in use. (See the subject of the Hypodermic Treatment of Syphilis in the author's "Dictionary of Treatment.")

Hydrargyri Iodidum Viride is green mercurous iodide—an unstable salt prepared by direct combination of iodine and Hg; it contains an excess of Hg. It is given in tertiary syphilis in pill form in $\frac{1}{2}$ gr. doses. The yellow Mercurous Iodide (U.S.P.) is a more reliable preparation, obtained by mixing solutions of mercurous nitrate and KI; it is given in doses of $\frac{1}{8}$ gr. in pills.

Hydrargyri Lactas is introduced as a mercurous salt suitable for hypodermic use in doses of $\frac{1}{4}$ gr. dissolved in 15 mins. water. It exists as a white or pinkish crystalline powder, to be distinguished from the more active mercuric lactate.

Hydrargyri Naphtholacetat is an insoluble white powder, and has been used like the thymolacetate, but it causes more pain and irritation. It may be given internally in pill, in doses of $\frac{1}{2}$ to 1 gr. It is used for gauzes and mulls.

Hydrargyri Nucleinas is known as Mercuriol; it is a dark yellow amorphous powder, which has been employed as a remedy for gonorrhœa when injected into the urethra in 2 per cent. solution.

Mercuriol is not to be confounded with this. It is an amalgam containing 40 per cent. Hg with magnesium and aluminium, which is intended to be worn in a sachet suspended from the neck inside the clothing, the patient breathing the volatile mercury which is driven off by the heat of the body.

Hydrargyri Paraphenol Sulphonas cum Ammon. Tart. is known as Asterol, and is introduced as an ideal antiseptic by Steinmann. It is a soluble pinkish powder, which may be used as a disinfectant where the perchloride is indicated in 2 to 5 per cent. solution. It is a combination of Ammonium Tartrate with Hydrargyrol, which is mercury phenol-para-sulphonate existing in dark red scales, which decompose on the addition of water.

Hydrargyri Peroxidum is a red powder, used as an antiseptic; on the addition of water it liberates oxygen, forming hydrogen peroxide and mercuric oxide.

Hydrargyri Salicylas is a white, tasteless, insoluble powder, used for hypodermic injection and as a remedy for gonorrhœa. It is formed by mixing solutions of nitrate of mercury and salicylate of soda. It causes no pain, and is as powerful an antiseptic as corrosive sublimate. Its great drawback is its insolubility, but Vacher has overcome this by using the following formula for external application:—1 part corrosive sublimate, 2 parts salicylate of soda, and 1,000 parts water. For internal use he injects 1 c.c. of the following solution:—1 part sublimate, 3 salicylate of soda, 100 water. This dose contains 0.154 gr. salicylate of mercury. It may be dusted like calomel over chancres, and given in doses of $\frac{1}{4}$ gr. in pills. There

is also a neutral salicylate of mercury, which is given in double the above doses as an injection suspended in sterilised liquid paraffin.

Hydrargyri Silico-Fluoridum — This colourless, soluble salt is used as a substitute for the sublimate, being less poisonous and irritating, and equally efficacious in destroying bacteria in solution 1 in 1,000.

Hydrargyri Sozoiodol is a pale yellow powder, soluble in solution of iodide or chloride of sodium. It has been given in $\frac{1}{2}$ gr. doses, with $\frac{2}{3}$ gr. sodium iodide, injected into the buttock, and as a powder (1 in 15) sprinkled on chancres and syphilitic sores.

Hydrargyri Succinimidum is recommended for hypodermic use, as it does not precipitate albumin. It is a white shining powder, soluble in water, and does not cause any suppuration at the point of injection. Wolff uses a Pravaz syringe of a 2 per cent. solution (1 per cent. Hg); thus each injection equals nearly $\frac{1}{2}$ gr. mercury. He states that it is preferable to mercury glycooll, and should be injected deeply in an oblique direction under the skin of the buttock into the subcutaneous fat, and the swelling stroked gently till dispersed; about 20 injections are the average number for ordinary cases. Cocaine is usually added to lessen the pain of the injections.

Hydrargyri Sulphas Ethylendiaminata (Sublamine) is a white soluble powder, which acts in 1 in 500 alcoholic solution as a powerful antiseptic and disinfectant for the hands and instruments. The corresponding citrate in solution is known as Mercuramine. Both salts are highly poisonous, and should not be given internally.

Hydrargyri Sulphas. — The mercuric sulphate or persulphate is a white powder, which, on the addition of water, turns into the yellow subsulphate (Oxysulphate) or Turpeth Mineral, which, under the name of Bazin's Ointment 32 grs., to 1 oz. benzoated lard, is used in tinea. Mercuric sulphate acts as an emetic in 2 to 5 gr. doses, but is seldom employed.

The mercurous sulphate is not used in medicine. The Red Sulphide (Vermilion or Cinnabar) is only used externally as an ointment for dressing syphilitic sores.

Hydrargyri Tannas is a tannate of the protoxide of mercury, and contains 50 per cent. of the metal. It is a green, tasteless powder, which decomposes upon the addition of weak alkalies, setting free mercurial globules, and it is believed that such a decomposition takes place in the bowel, and the minute particles of mercury rapidly find their way into the blood. 1 to 2 grs. are administered 3 times a day. It does not produce any unpleasant after-consequences or disarrangement of the digestion.

Hydrargyri Thymolacetas is a white, crystalline, inodorous insoluble powder, prepared by mixing solutions of acetate of mercury and thymol. It is given internally ($\frac{1}{2}$ gr.), and used as an injection (10 per cent. in liquid paraffin) into the muscles in syphilis, the injections being stated to be nearly free from pain and the danger of abscesses. Vaseline oil is the usual menstruum.

Hydrargyrum Colloidale, or Hyrgol, is a black solid substance introduced as a substitute for metallic mercury in making ointment for inunction (1 in 12). Colloid mercury has also been given internally and hypodermically, but owing to its impure condition it has

been little used of late. Kaufmann and Heinz have recently employed 0·2 per cent. aqueous solutions, with a little sodium chloride, by the rectum.

Hydropyrin is a new introduction. It is the sodium salt of Aspirin or Acetyl-salicylic acid. Its only advantage is its solubility and the readiness with which it splits up in the stomach into the free acid. It is given in rheumatism, migraine, and gall-stones in 10 to 15 gr. doses, but it is unstable and very hygroscopic.

Hydroquinone (Quinol or Hydrochinon) is a derivative of coal tar, and is isomeric with resorcin. It occurs in odourless, colourless crystals, and has been given in typhoid and other fevers. It reduces the fever temperature rapidly, a gramme dose causing a fall of 6 or more degrees. Its effects are more evanescent than quinine or antipyrine, a smart rigor generally issuing in a rise in 4 or 5 hours again, but it is now seldom used except in photography.

Hydroxylamine is an odourless, colourless body, being ammonia in which 1 atom of hydrogen is replaced by hydroxyl. The hydrochloride is the form in which it is always used. It is a powerful reducing agent, and has been recommended as a substitute for chrysarobin, pyrogallallic acid, and anthrarobin in psoriasis, lupus, and parasitic skin diseases when used as a 1 in 1,000 solution. The results are doubtful, and the agent is a powerful irritant, and when taken internally it is a dangerous poison.

Hypnal, or Monochloralantipyrine, is a crystalline body obtained by mixing strong solutions of chloral hydrate and antipyrine. It is almost tasteless; it has all the properties of chloral hydrate, and all its objectionable points—*i.e.*, it depresses the heart seriously, though in ordinary cases of insomnia it is an effective hypnotic in 20 gr. doses. It must not be given where the heart is affected. It is claimed for it that it will induce sleep in the presence of pain.

Hypnone, or Acetophenone, is phenyl-methyl-acetone, introduced as an hypnotic; it is a strong-smelling, colourless, volatile liquid, insoluble in water. It is an antiseptic, and has been used in mask inhalers, but it is an uncertain and dangerous drug. In capsules, 1 to 5 mins. for a dose.

Ichthynate is a thick, reddish-brown oil, obtained from bituminous shale, sulphonised and transformed into the ammonium compound (Merck). It possesses most of the properties of ichthyol, and is used in the same manner.

Thiol is a similar substance obtained from gas oil; it is procurable in the dry form (dose 5 to 10 grs.) and as a thick liquid, used like ichthyol.

Tumenol is another ichthyol substitute of the same physical character; it is a mixture of tumenol sulphone and tumenol-sulphonic acid. An ammonium tumenol is obtainable, which is soluble in water, and mixes like ichthyol with glycerin and fats.

Ichthyocolla (Isinglass), formerly known as Fish Glue, is the dried swimming bladder of various fish cut up into fine shreds. The best variety is the Russian, which is obtained from the sturgeon (*Acipenser*). It is soluble in hot water, and forms a jelly when cold. It

is a valuable nutrient like gelatin, and may be taken *ad lib.* in soup or warmed milk. It is the basis of the various "court" plasters in common use.

Ichthyol, or Ammonium Sulpho-Ichthyolate, is a tarry-looking, viscid liquid, prepared from a bituminous mineral in the Tyrol, consisting of fish and animal remains, and containing 15 per cent. sulphur. It is entirely soluble in water, and mixes in all proportions with glycerin and fats. It is an antiseptic, and kills most disease germs; it is a local anæsthetic; it acts upon the small vessels, causing them to contract; it promotes the absorption of exudations; by saturating the system with sulphur it has been found to possess all the good qualities of that drug; it acts as a reducing agent, taking up oxygen from the tissues; it relieves itching and it retards metabolism.

It is of use in all diseases in which there is capillary engorgement, and many observers strongly testify to its power in a host of widely different ailments, as chronic rheumatism, pleuritis with effusion, syphilis, asthma, whooping-cough, chlorosis, scrofula, phthisis, gout, vesical, intestinal and gastric catarrhs, pelvic neuralgia, and neuralgia of bones, joints, and muscles, metritis, and uterine diseases. It is given in doses of 10 to 30 grs. in capsules, but much larger doses do no harm. In gonorrhœa a 3 per cent. injection has proved most valuable, and it has been extolled as an injection in cystitis and diseases of the uterus and Fallopian tubes. Externally a 3 to 30 vaseline ointment is employed for wounds and burns, and excellent results are obtained by a 20 per cent. collodion, or a 50 per cent. ointment in erysipelas, owing to its lethal action on the bacilli; the best formula is equal parts of lanoline and ichthyol. Since it produces so little irritation it may be used in any strength of ointment from 2 to 30 per cent. in eczema, acne, psoriasis, herpes, erythema, boils, carbuncles, and ringworm. A 10 per cent. ichthyol vasogen gives excellent results in gonorrhœal rheumatism if applied to the joint and covered over by oiled silk and wool. For acne rosacea Unna employed a paste made of equal quantities of ichthyol and starch moistened with half as much water; to this 1 per cent. solution of albumin is added. The writer has found it, when made into a suppository with conium ointment, to be a splendid agent for the relief of fissures and hæmorrhoids. The B.P.C. paste consists of ichthyol, gelatin, glycerin, and water (about 1 in 10). The B.P.C. has also a Compound Paste.

Sulpho-ichthyolates of Lithium, Soda, and Zinc are also employed. They act like ichthyol, which is often prescribed as ammonium ichthyol, but soda ichthyol or sulpho-ichthyolate of soda is often preferred for internal use, though there is practically no difference. Unna uses ichthyolate of calcium in lichen, and ichthyolate of iron (Ferrichthol) in anæmic cases.

Unna has introduced a 33 per cent. solution of ichthyol-sulphonic acid under the name of Anytin. He claims for this solution that it has the power of dissolving the other constituents of ichthyol, and to their solutions he gives the name of Anytols; thus the anytol of meta-cresol, known as Metasol, is a powerful antiseptic.

Ichthyol-Resorcin consists of a mixture of 9 parts of the drug with 1 of resorcin.

Ichthyol-Salicyl is a dusting powder, consisting of $\frac{1}{4}$ to $\frac{1}{2}$ of sodium salicylate to 1 of ichthyol, which may also be given in cachets in rheumatism and phthisis.

Ichthalbin is a brown, tasteless powder. It is a compound of ichthyol with albumin, prepared like tannalbin, and is tasteless, and insoluble in the stomach, splitting up in the duodenum. 4 parts are equivalent to 3 of ordinary ichthyol. It is intended for internal use (5 to 15 gr. doses), and is suitable in intestinal catarrhs, but it is valuable as a local remedy in all weeping eczemas, especially in children.

Ichthargan (Silver Ichthyolate) is a compound of ichthyol sulphonic acid and silver. It is a brown, soluble powder, with powerful antiseptic qualities; it is used in 0.2 per cent. solution injected in gonorrhœa. It contains 30 per cent. of silver, but is more potent than the nitrate, and is much used in veterinary practice.

Ichthoform is a formaldehyde compound of ichthyol, which may be used like iodoform, or given in 15 or 20 gr. doses as an intestinal antiseptic in diarrhœa.

Ingluvin is a powder prepared from the gizzard of the common fowl, and it was introduced as a variety of pepsin to supplement the action of the gastric juice in atonic dyspepsia, and as a remedy for the vomiting of pregnancy in 10 gr. doses. It has been proved that ingluvin exerts a very feeble digestive action upon albuminous foods outside the body.

Iodalbacid is a yellowish-brown powder devoid of taste or odour, and soluble in water. It contains about 10 per cent. of iodine in combination with albumin, and it is claimed for it that it is less depressing than the iodides of sodium and potassium, and therefore more desirable in the treatment of arterio-sclerosis, tertiary syphilis and epilepsy, where large doses of iodides are administered for long periods. It is given in doses of 15 to 20 grs.

Iodglidine is a substance closely resembling the above, being a compound of iodine with glidine—the vegetable albumin of wheat. Like iodalbacid, it is non-irritating and slowly absorbed, and it may be given in the same doses.

Iodalbin is another albumin or proteid compound of iodine, existing as a dull red powder, but, unlike the two last-mentioned substances, it is insoluble in water, and passes unchanged through the stomach till dissolved by the alkaline secretions of the liver and pancreas. It contains over 20 per cent. iodine, and is given in cachets in 10 gr. doses.

Iodine Trichloride is an antiseptic introduced by Langenbuch; it exists as a crystalline mass or as a yellow powder prepared by acting on iodine with dry chlorine gas. It contains over 50 per cent. iodine. 1 dr. in 1 gall. water makes a solution which, when applied to wounds, or used for flushing the abdomen, or washing the urethra in gonorrhœa, by means of the iodine monochloride formed on dissolving the salt in water, acts as a powerful antiseptic and disinfectant without the dangers of carbolic acid, iodoform, or sublimate. A 1 per cent. solution may be used for disinfecting the hands.

Iodipin, Jodipin, or Iodinol, is an oily yellow fluid being an addition compound of iodine with sesame oil, analogous to brominol. It is

a most valuable form for the administration of iodine, and can be given where ordinary iodides are not tolerated. It passes unchanged through the stomach, and is absorbed unaltered by the bowel, and in the blood and tissues slowly gives off its iodine at a steady, continuous rate. A month after its administration has ceased iodine may be found in the urine. It is indicated in every condition where iodides are useful, as in arterio-sclerosis, uterine fibroids, bronchitis, asthma, rheumatism, and especially in syphilis, where it has been given hypodermically with most gratifying results. It is supplied in 10 and 25 per cent. strengths. 2 to 4 drs. of the weaker liquid are given by the mouth in warm milk or coffee, and 45 to 90 mins. of the 25 per cent. solution can be injected warm through a wide needle; this latter dose represents 15 to 30 grs. iodide of potassium. The stronger iodipin can be procured in capsules of 30 mins. each, and a solid preparation in tablet form is also in use. Iodipin can also be given by inunction. Martindale gives the formula of 1 part iodipin (25 per cent.) and thick malt extract 3 parts for internal administration in scrofula.

Iodised Phenol is a dark, thick liquid, or semisolid paste, prepared by rubbing at a gentle heat, iodine 1 oz., and pure carbolic acid 4 ozs., till dissolved. It is a caustic and powerful alterative when applied to uterine ulcerations, and is the best local treatment for abrasions and granular conditions of the cervix. The writer has found that it prevents buboes when lightly painted over the inflamed glands. It is used with success in ringworm of the scalp and body.

Iodival is the name given to mono-iod-isovalerianyl-urea—a solid crystalline body containing 47 per cent. of iodine in organic combination, introduced as a substitute for the inorganic iodides in tertiary nerve lesions, asthma, arterio-sclerosis, etc. It passes unchanged through the stomach till it reaches the duodenum, where it forms a soda salt, which is slowly absorbed and decomposed in the blood and fatty tissues.

Iodocaffeine (Sodium-caffeine Iodide) is a white powder, introduced as a diuretic in cardiac dropsy, possessing the actions of caffeine and an alkaline iodide, and closely resembles in action Iodotheobromine, which is, however, more markedly diuretic. They may be given in doses of 5 to 10 grs. in cachets.

Iodo-Caseine, or Caseo-iodine, is a white powder, containing 8 or 9 per cent. of iodine, combined in the same manner, it is supposed, as the iodine is in iodothyryl obtained from thyroid gland substance. This substance, as well as a similar one containing about 20 per cent. iodine, and introduced by Lepinois, is recommended in exophthalmic goitre.

Iodoform.—Many other iodoform and iodine compounds and substitutes will be found under their popular or trade names, as Amyli Iodidum, Aristol, Di-iodoform, Europhen, Loretin, Nosophen, Traumatol, Sozoiodol, Vioform, etc., and the following:

Iodoformal (Iodoformin Ethyl Iodide), in yellow insoluble crystalline powder, is a powerful antiseptic, introduced as a substitute for iodoform, of which it is the ethyl-hexamethylene hydriodide. It is claimed to be more potent than iodoform by Reuter.

Eka-iodoform is described under its own name.

Iodoformin is a whitish crystalline powder known as "odourless iodoform." It is a compound of iodoform with hexamethylenetetramine. It is used as a substitute for iodoform. It acts in the same way, but it is claimed for it that the formol liberated on sprinkling or applying it as a gauze over chancres, tubercular ulcers, etc., acts as a stimulant to the sores, and hastens granulation without forming scabs. It has been injected in gonorrhœa.

Iodoformogen is an albumin compound of iodoform, containing 10 per cent. of the latter substance. It is a mild and odourless preparation, and has given excellent results as a dusting powder in cases of ulcers, and its use is said to be never followed by eruptions.

Iodol (Tetraiodopyrrol) is a yellowish-brown crystalline powder, containing nearly 90 per cent. of iodine. It is nearly odourless, soluble in ether, and almost insoluble in water. It resembles iodoform in its action, and affects the system like iodide of potassium when taken internally, only that it is very slowly absorbed. 5 to 10 grs. may be given in pill or capsule where this latter salt is indicated. It has been used as a dusting powder to wounds, ulcers, and sores, or as an ether (1 in 10), ointment (1 in 8), or as a paste made with a little spirit. It has been lauded in tubercular laryngitis and pharyngitis, and is praised by some ophthalmic surgeons as an application to granular lids, and has been successfully injected as an emulsion in gonorrhœa.

Mazzoni's formula is—Iodol 1 dr., alcohol 2 ozs., glycerin 4 ozs.

Menthol Iodol (1 per cent. menthol) is a non-irritant antiseptic, used in diseases of the nose and throat and larynx. It is a valuable antiseptic and analgesic when plugged into hollow carious teeth.

Iodolene (Iodol Albuminate) is a fine, yellow, odourless powder; it is an unirritating antiseptic used as an iodoform substitute. The 10 per cent. preparation has been given in 30 gr. doses in syphilis in the tertiary stage, and in actinomycosis, and the 36 per cent. preparation is used as a dusting powder.

Iodolose (Glycogen Iodi) is a dark reddish-brown liquid, containing 3 per cent. of a compound of iodine with glycogen. It is given in 20 min. doses as a substitute for the iodides of sodium and potassium in syphilis and scrofula.

Iodopyrin, or Iodantipyrin, an odourless, tasteless crystalline powder, is a compound of iodine and antipyrine; it is a powerful antiseptic and antipyretic, and has been given in 10 gr. doses in all the conditions where antipyrine is indicated, and it is also recommended in rheumatism and asthma. It is best given in tabloid form.

Iodoterpine is a dark, terebinthinate-smelling liquid, prepared by the interaction of terpine and iodine, which it is proposed should take the place of liniment of iodine, as it is readily absorbed by the skin. It is used as a substitute for iodoform when mixed with 10 parts of kaolin.

Di-iodide of Terpine, known as Pneumococcine, is a similar compound, existing as a colourless, fragrant, oily liquid, which has strongly lethal action over the pneumococcus. It has been given hypodermically in 30 min. doses in acute pneumonia, and in 15 min. capsules in tuberculosis.

Iodothyrim (Thyro-iodin) is the name given to an amorphous brown powder containing iodine extracted from the thyroid gland. Thyrocol is another preparation from the colloid material which has been isolated by Hutchinson, and Thyroglandin is a dry extract said to contain all the active principles of the gland. It is claimed for these and other active principles of the gland that they should supersede the use of the dry gland. It is, however, by no means demonstrated that they possess all the virtues of the gland substance. (See Thyroid.) Stabel and Brian, while acknowledging the value of iodothyrim as a powerful alterative, deny its value in the cases where ordinary thyroid gland substance proves so efficacious. It acts powerfully on metabolism. It is standardised to contain 0.03 per cent. iodine, and it is given in the same dose as the dried gland.

Iodyloform is an insoluble powder containing 5 per cent. iodine. It is formed by rubbing together iodine and gelatin. It is introduced by Müller as a stable innocuous substitute for iodoform in the treatment of venereal sores. It appears to resemble Amyli Iodidum (which see).

Iothion is Di-iodo-hydroxypropane—a straw-coloured, heavy, syrupy liquid, containing about 80 per cent. iodine, introduced for *external* use as a substitute for iodine ointments. A 25 to 50 per cent. lanoline ointment rubbed into the skin lightly once a day has given good results in tubercular osteitis, asthma, arterio-sclerosis, tertiary syphilis, etc. The drug is rapidly absorbed, and appears in the saliva or urine in a few minutes. It is a valuable addition to medicine, since it can be employed in the case of patients who cannot tolerate iodine in any form by the mouth. The drug is, however, an irritant to mucous membranes and to delicate sensitive skins, though in most cases it may be applied with a brush undiluted with safety. It is also known as **Jothion**.

Iohydrin is a closely allied substance, being Di-iodo-iso-propyl-alcohol. It is employed in the same manner, its use being restricted to the inunction method.

Iris, or Blue Flag.—The rhizome and rootlets of *Iris versicolor* yield a fluid extract and eclectic preparation in the form of a brown powder. This latter preparation, known as Iridin, is the one generally used. It acts as a powerful hepatic and intestinal stimulant, and closely resembles podophyllin in its effects. It is believed to possess alterative properties, which have given it a reputation as an antisyphilitic and antiscorbutic. It is a diuretic, and has been found to remove jaundice of malarial origin. $1\frac{1}{2}$ to 3 grs. every night in the form of a pill, followed by a mild saline, have given good results in the vomiting of pregnancy and in torpid liver.

Isoform is Para-iodo-anisol—a white crystalline powder in silvery flakes, given in 4 to 8 gr. doses, diluted with an equal weight of calcium phosphate, as an intestinal antiseptic in dysentery and tubercular disease of the bowel. As the crystals are explosive when heated, the drug is usually administered mixed with glycerin in capsules. Externally it has proved valuable as a dusting powder (1 in 10), mixed with talc, or as a glycerin paste, or 10 per cent. ointment.

Itrol (Argenti Citras) is a light permanent powder used for insufflation. It is claimed for it that it possesses all the advantages of actol

without producing irritation. It may be dusted over wounds and ulcers, and injected (1 gr. in 16 ozs.) in gonorrhœa and cystitis. 1 in 500 disinfects instruments and hands, and 1 in 1,000 may be used as a gargle for the throat. Credé maintains that this agent is "the wound antiseptic proper," and is a certain means of keeping wounds sterile if dusted very thinly over them. Acetate of silver possesses similar properties; a 1 per cent. solution is used in ophthalmia neonatorum.

Izal is a liquid obtained from coke-oven oil. It exists in three varieties: (1) Medical Izal Oil, which is administered in 2 min. doses in capsules in diarrhœa, cholera, and tuberculosis, also used as an inhalation and spray. (2) The 40 per cent. emulsion, also used internally in proportionate dosage alone or with cod-liver oil in phthisis and as an intratracheal injection. Both preparations are non-toxic and powerful antiseptics, and they may be applied undiluted in tinea and lupus. (3) Izal disinfecting liquid, which contains 40 per cent. of the crude izal.

Jacaranda Lancifoliata has been used as a remedy for venereal diseases amongst the natives of Columbia, and Mennell has tried it with considerable success in gonorrhœa and gleet which had resisted other treatments. He gave 15 min. doses of the tincture (2 ozs. to 1 pint), and in obstinate gleet injected 10 mins. to 1 oz. water, which stopped the discharge rapidly. It has been used also with success in psoriasis and rheumatism, and it can be combined with iodides advantageously. Limousin gives the dose of the fluid extract, known as Salud, as 15 to 60 mins. three times a day. *Jacaranda procera*, known in Brazil as Caroba, or Carobinha, has similar properties.

Jambul, or *Syzygium Jambolanum*.—The seeds have been tried in diabetes, in some cases with no result, whilst in others the remedy was beneficial to an unexpected extent. Fenwick reports a case where, in one week, sloughing ulcers rapidly healed, and the urine fell to one-half after $2\frac{1}{2}$ grs. powdered seeds three times a day. 30 grs. may be given. It has been proved that the drug has a marked power in diminishing phloridzin diabetes in dogs. The fruit is used in India as an astringent in dysentery and diarrhœa, and the bark as an antidiabetic remedy.

Jequirity Seeds (*Abrus precatorius*, Jumble or Prayer Beads) contain abrin—a powerful irritant poison. The glycerin extract, Jequiritol, has been employed to produce a severe inflammation of the conjunctiva, with the view of removing corneal opacities and granulations left after trachoma, but the dangers following its instillation, even when limited by the serum prepared from immunised animals, are still so great that the remedy should only be employed by experts.

Juglans Cinerea, or Butternut.—The bark of the root has been long used as a mild purgative, and in smaller doses as a laxative in chronic constipation. Combined with calomel, it has been given in intermittent fever and in dysentery. The nuts yield a bland, un-irritating oil. The dose of the fluid extract is 1 to 2 drs. The resinous extract (Juglandin) may be given in doses of 2 to 5 grs. as a purgative.

Kava Kava, or Ava-Ava, is the rhizome of *Piper Methysticum*. Kava was prepared from it by masticating the root for some time in the mouth, adding water to the fibrous pulp resulting from the chewing, and straining (Yangona brewing). It is now generally prepared by simply pounding or grating the rhizome. After a moderate dose the effect appears to be something like that produced by a large dose of caffeine—a sharpening of the mental faculties and a feeling of freedom from fatigue.

It acts upon the cord, and causes an ataxic gait, after being very freely swallowed, the intellect remaining bright. Kesteven found that it acts as an alterative upon the genito-urinary organs, and he used it with success in chronic gleet and obstinate cystitis; it is a stimulating diuretic. The *a*-resin obtained from it acts powerfully as a local anæsthetic like cocaine, and produces anæsthesia of the mouth, which lasts for hours. Internally it produces general anæsthesia by destroying the function of the peripheries of the sensory nerves. (See Colonial Addendum.)

Keratin is a substance soluble in alkalis, obtained from horn or quill shavings; it is used for coating pills in order that they may pass through the stomach without being acted upon by the gastric juice. Recently Zypkin has reported remarkable success in the treatment by keratin of tabes, chronic myelitis, and diseases characterised by proliferation of fibroid tissue. The drug appears to act like fibrolysin; the dose is about 100 grs. thrice daily in tablets.

Kola.—The seed of *Cola vera* and *C. acuminata* has been used by the natives of Central Africa as a substitute for tea and coffee, as an agent to prevent fatigue in muscular exertion. It contains an alkaloid identical with caffeine. Monnet found it produced insomnia, was an aphrodisiac, stimulant to the cerebrum, restrained tissue waste, was diuretic and had powerful cardiac tonic properties, and controlled diarrhoea, and acted as a general tonic in doses of 1 dr. of the tincture (1 of the nut to 5) or 2 grs. of the alcoholic extract. It is a gastric tonic, useful in dyspepsia, and an astringent in diarrhoea on account of the tannin it contains, in doses of 15 mins. of the B.P.C. fluid extract (1 in 1).

Koumiss is a palatable, effervescing liquid, prepared by exciting fermentative changes in the milk of the cow or mare. It was originally made in Tartary from the milk of the mare, but cow's milk is the basis of all the varieties at present used in this country.

Since the publication of Metchnikoff's researches upon the power of the lactic acid bacillus of inhibiting the growth of the *Bacillus coli* in the intestines, a host of preparations containing the lactic acid bacillus has been introduced. Thus Martindale supplies Trilactine Liquid and Trilactine Tablets for the curdling of cow's milk. These contain in an active state the three strains known as Günther's and Hüppe's lactic acid bacilli along with the *B. Caucasicum*.

Lactobacilline, Fermentlactyl, Biolactyl, Sauerin, Anticolin, Lactoserve, Lacteol, and other preparations are in common use, being generally added to sterilised milk, which is then permitted to stand in a warm place for several hours. Lactoserve, when mixed with hot water alone, forms a liquid resembling buttermilk.

The artificial koumiss of Sakovich and that of Ponomaroff were

made with yeast and sugar added to milk. The writer has been using continually for the last twenty years an artificial koumiss which supplies in a most palatable and nutritious form all the requirements insisted upon by those who carry out Metchnikoff's recent suggestions. The following is the formula which appeared in the first edition of the "Dictionary of Treatment" (1892):

"A palatable and highly nutritious beverage may be prepared by mixing 1 part of fresh rich buttermilk and 1 part of water with 8 parts of cow's milk, adding a very little loaf sugar, putting the mixture into a loosely-corked gallon jar, leaving it in a *warm*, but not hot, place beside the fire, where it may be frequently and briskly shaken, and in 36 to 48 hours it is ready for use as a pleasant, sharp-tasted, thick liquid, which slightly effervesces. Some little skill and experience are required in producing a uniform result, and the patient should not give it up if the first and second results are unsatisfactory. After the first batch of this artificial koumiss has been successfully prepared the use of buttermilk may be entirely dispensed with, as an equal bulk of the koumiss liquid can be used instead in the preparation of each subsequent quantity. Some patients succeed best by leaving out the sugar entirely, and by shaking the mixture very seldom during the first 24 hours. It may be taken *ad lib*. The buttermilk referred to above is that obtained in the process where the cream and milk have been both churned together in the manufacture of butter. The article commonly known as buttermilk in England will not make koumiss."

The common cause of failure in making koumiss by the above formula for the first time is that the mixture has been overheated: in summer the ordinary temperature of the kitchen is quite sufficient away from the fire.

Koumiss is undoubtedly one of the most easily assimilated and nutritious of foods and remedies. It is invaluable in the treatment of all wasting lung diseases, in which case it may be taken *ad libitum*. The weight of the body soon markedly increases under its use, and it will be appreciated when cod-liver oil cannot be tolerated. In various forms of dyspepsia, and especially in the diarrhoea of children, its use is attended with great benefit. In the protracted convalescence after fever, kidney disease, etc., and in many forms of chronic vomiting, it may be tried with every prospect of success; and, as recently demonstrated, it is invaluable in gastric and intestinal affections and in whooping-cough.

Kefir.—Under this name a fermented milk has been long used by the natives of the plains near the Caucasus as a remedy for anæmia, struma, chest affections, and gastric troubles. It is like koumiss, and is prepared from the milk of the cow or mare by adding a fungus which contains yeast and *Bacillus acid. lact.*, and which can be used over again repeatedly, producing a rich, sparkling beverage. In the vessel in which this kefir is made small hard granules are found of a brownish-yellow colour. These maintain their activity unimpaired for long periods, and are very convenient for the manufacture of this beverage, but, as a rule, the above formula for Koumiss answers all requirements.

Kryofin is a crystalline, colourless, sparingly soluble salt. It is methyl-glycolate of paraphenetidin, and is an antipyretic and anal-

gesic in doses of about 5 to 8 grs. in all conditions in which antipyrine is indicated. It has been extolled in acute rheumatism, syphilitic neuritis, uræmic headache, and acute sciatica. It sometimes causes profuse sweating.

Lactophenin, Lactyl-phenetidin, or Para-phenetidin lactate, is a colourless crystalline powder, being phenacetin in which the acetic is replaced by the lactic acid group. It is introduced as a substitute for phenacetin on account of its greater solubility. Numerous reports show that in typhoid fever, migraine, rheumatism, and neuralgia excellent results are obtained when given in capsules in 10 gr. doses.

Malakin is a closely allied substance in yellow crystalline powder, being Para-phenetidin salicylate; it possesses no advantages over lactophenin. Phenosal is the Aceto-salicylate recommended as an antipyretic and analgesic in 5 to 10 gr. doses. It should not be confounded with Phenosalyl, which is a mixture of salicylic acid 20, carbolic acid 90, menthol 1, and lactic acid 1, used as an antiseptic dressing for wounds (1 per cent.) and for eczema.

Lævulose (Diabetin or Fructose) is a white crystalline sugar found in elecampane and other roots. It is very sweet, and does not increase the sugar in saccharine diabetes, being, in moderate doses, all assimilated. It may be used as a sweetening agent for diabetics. It exists in large amount in the dahlia tuber after boiling, and Hale White consequently recommends this as a food for diabetics.

Largin (Silver Albuminate) is a brown soluble powder containing 11 per cent. Ag. It is used as an injection in gonorrhœa (1 gr. in 8 ozs.). The reports of its usefulness in eye surgery, 10 per cent. solution, are most satisfactory, especially as it does not cause pain, but it is inferior to the nitrate in gonorrhœal ophthalmia.

Lecithin (Ovo-Lecithin, or Di-stearo-glycerophosphate of Choline) is a wax-like solid body, rich in phosphorus, prepared from germs of oats, yolk of eggs, etc. It is a constituent of brain and nerve tissue, and has been introduced as a substitute for phosphorus for internal administration in neurasthenia, tabes, brain diseases, tuberculosis, diabetes, rickets, etc. Serono's egg preparation, when fresh, is harmless. He injects 1 c.cm. daily, and finds great increase in nitrogenous metabolism, red corpuscles, and body-weight. Peritz maintains that as there is great increase of lecithin elimination in tabes and tabetic paralysis, the disease is due to the absence of this substance, and he therefore recommends intramuscular injections of lecithin, and reports favourably of his results. The drug has the power of setting free great quantities of bacillary toxins, and, by bringing it into contact with typhoid and tubercle cultures, powerfully immunising toxins can be obtained.

Lecithin may be administered in 3 gr. tablets, or injected in half this amount dissolved in sterilised olive oil. A preparation with cocoa, known as Lecitogen, is also in use, and may be given in dessert-spoonful doses like Sanatogen.

Leptandra, or Culver's Root.—The eclectic preparation (Leptandrin), from *Veronica* or *L. virginica* in the form of a brownish-green powder, resembling podophyllin, is the one generally used in medicine. It has been used in liver diseases, as a tonic, cholagogue, and purga-

tive, according to the dose administered. It stimulates mildly the liver, and acts as an intestinal tonic and stimulant or irritant, and has been used in diarrhœa and dysentery, and as an adjuvant to podophyllin in 3 gr. doses in pill.

Lithium Salts.—Quite a number of new lithium compounds have been introduced, chiefly as solvents for uric acid.

The Bitartrate is recommended in 10 to 20 gr. doses in a large quantity of aerated water in suppurative gingivitis and gout. The Bromide contains over 90 per cent. bromine, and is recommended as a substitute for potassium bromide, as being richer in bromine and being diuretic in 15 gr. doses. It is claimed for this salt that it diminishes albumin in Bright's disease. The Salicylate is given in solution in 20 gr. doses. The Benzoate (95 per cent. benzoic acid) in 15 to 30 grs. The Guaiacate in chronic rheumatism in 5 gr. pills. The Hippurate in solution, in uric acid gravel, in 15 gr. doses. The Iodide is a white crystalline powder given in 3 to 5 gr. doses; it contains about 95 per cent. iodine. Lithium Diuretin or Uropherin, and Uropherin B. are powerful diuretics in cardiac dropsy and Bright's disease in 15 gr. doses in solution. The Ichthyol Sulphonate has the same action and dose as ichthyol. Lithium Symphorol is powerfully diuretic in 15 gr. doses in gout and dropsy. A combination with Piperazine is reported to be a powerful solvent of uric acid. Lithio-rubidio-platini Cyanide, according to Merck, becomes intensely fluorescent under the Röntgen rays. Uricedin is a brown powder containing citrate of lithium with citrates and sulphates of alkalis, prepared by acting upon strong lemon juice with acids and then neutralising. It is used in gout in doses of 1 to 2 drs. Urosin is the name given to the quinic acid salt; it is given in doses of 5 to 15 grs. Uresin is hexamethylenetetramine dilithium citrate—a white powder given in 5 gr. doses. Lithion is the name given to an aperient preparation containing the citrate mixed with Glauber and Epsom salts. The Glycerophosphate, a white, soluble powder, is given in 5 gr. doses. The Salolo-phosphate, or Solvosal-Lithia, is used as a disinfecting mouth wash, and as a substitute for the salicylates in rheumatism in doses of 4 or 5 grs.

Loretin is a yellow, odourless, crystalline powder, introduced as a substitute for iodoform. It is Meta-iodo-ortho-oxychinolin-ana-sulphonic acid. It may be used as a dusting powder in every condition in which iodoform has been employed, and it appears to be absolutely unirritating, as it has been used in eczema, and it is claimed for it that it has no toxic properties. It is used as a colloidion 8 per cent. for erysipelas, and can be applied alone or with chalk, or in an ointment. In the form known as Griserin, loretin is mixed with carbonate of sodium to ensure its solubility. It may be taken as an intestinal antiseptic in doses of 5 to 8 grs.

Lycoperdon Giganteum, or Puff-Ball.—This interesting fungus, belonging to the natural order Trichogastres, is found near the fences on the margins of woods, and has been long known to possess hæmostatic properties. It forms a soft and comfortable *surgical dressing* in addition to its hæmostatic qualities. The mature plant, which is about the size of a foetal head, is employed. On breaking the outer skin, the dusty mass, consisting of the capillitium and spores, is the

portion used. The writer used it in formidable hæmorrhages, dusted over the bleeding surface, and plugged into deep and tortuous wounds where the open vessels could not be reached with a ligature, and the rapid and effective manner in which it arrested bleeding was most surprising. He finds it to be an excellent remedy for epistaxis, and he plugs the nostrils with the fungus, leaving it *in situ* for several days, and always finds it to act most satisfactorily. Since the introduction of adrenalin the drug will be less used, especially as it cannot easily be sterilised.

Lycopodium Clavatum.—Fenwick speaks of the great value of a tincture made from white club moss in frequent micturition and irritable bladder. He gives 15 to 60 mins. of an ethereal tincture (1 in 5). The drug is used also in the spasmodic retention of urine in children; it is also a carminative and laxative, and has been given in enteritis and rheumatism. Externally, it may be dusted over eczema and intertrigo in children and fat subjects.

Lysoform is a clear, yellow, soapy fluid, consisting of formaldehyde, potash soap, and some aromatic bodies which remove the objectionable odour of this drug. It is a powerful antiseptic, and is used to disinfect the skin of the hands, which it keeps soft and flexible, and in 1 per cent. solution to disinfect the bladder and urethra. A 25 to 50 per cent. ointment is used for ringworm, 10 per cent. ointment for seborrhœa and psoriasis, and half this strength for eczema. It makes a cleansing oral wash $\frac{1}{8}$ per cent.

Carbol Lysoform is a combination of cresols with lysoform, and has powerful bactericidal action. Lysol is not to be confounded with Lysoform; it consists of cresols only, and has no formaldehyde action.

Magnesium Salts.—In addition to the official compounds the following are in use:—The Benzoate is aperient, antirheumatic and antipyretic, existing as a white crystalline powder, given in 15 gr. doses. The Boro-citrate is in white powder, or in shining scales, prepared by adding citric acid to a mixture of magnesium oxide and boric acid. It may be given in 30 gr. doses as a substitute for boric acid in cystitis; more frequently prescribed with twice its weight of sugar as Boracite. The Bromide possesses no advantage over sodium bromide given in similar dosage. The Cacodylate is a white amorphous powder, very soluble in water, and may be given hypodermically, like sodium cacodylate, in $\frac{1}{4}$ to $\frac{3}{4}$ gr. doses. The Chloride is a deliquescent salt, which may be used as a substitute for the official sulphate; it is milder in action, and may be taken in 1 oz. doses. Magnesii Citras Verus is a white powder, given as an aperient in doses of 2 to 4 drs. In the form of Liquor U.S.P. it is known as Purgative Lemonade, and is given in doses of a tumblerful. The Glycerophosphate is a white amorphous powder, given in 5 gr. doses dissolved in water. The Hydroxide is usually administered in the form of Magnesia Cream as an antacid in tablespoonful doses. The Lactate is a white crystalline powder, given in 30 to 60 gr. doses as a substitute for calcium salts in hæmorrhages. The Peroxide is a white powder, more stable than hydrogen peroxide; it is given in 30 to 60 gr. doses in intestinal fermentation, and is the active ingredient in Hopogan and Magnesium Perhydrol, and in

many dentifrices. The Hypochlorite and Hypophosphite resemble the sodium salts of the same name. The Sulphite is a white crystalline powder, given as an antiseptic in diphtheria and stomach fermentation in doses of 10 to 40 grs., in tablets or in weak solution. The Salicylate resembles the corresponding sodium salt in action and dosage. The Ricinoleate (Maricol) is a white powder resembling Risicol, and is employed as the basis of several purgative castor oil powders.

Malachite Green (Diamond Green) is the sulphate of Tetra-ethyl-di-*para*-amido-triphenyl carbhydride, introduced as a remedy for sleeping sickness, which, however, has not proved efficacious. It is not to be confounded with Methyl Green, which is the chlormethylate of hexamethyl-*p*-rosaniline hydrochloride, or its double zinc chloride salt, which has been demonstrated by Fühner to possess poisonous action like curare.

Malti Extractum, or Extract of Malt, or Byne, is a thick brown, treacle-like liquid, containing the active principle—diastase—a digestive ferment possessing the property, even when exceedingly diluted, of changing starch into dextrin and maltose. Its efficacy depends upon the amount of diastase present, which, in many of the extracts to be met with, is very trifling, but the food value of the maltose, always present along with the ferment in large quantities in maltine, must be taken into account. It is useful in cases where the digestive power is weak and the assimilation of starchy foods is imperfect. It may be given in doses ranging from a teaspoonful to a tablespoonful in milk, wine, beer, porridge, tea, or cod-liver oil after meals. Its high nutritive value renders it an agent of great utility in phthisis, scrofula, rickets, and many wasting diseases. It is a good plan to mix it with the food before being swallowed in dyspepsia, and wherever the digestive functions seem to be seriously impaired. It should be given at the *beginning* of a meal. It will not act in acid fluids, and consequently is of most value when given at a time when the acidity of the stomach is least. The Liquid Bynin is more easily administered than the viscid extract. It contains about 7 per cent. alcohol. Malt Cream and Maltine are special preparations, and many combinations with cod-liver-oil, hypophosphites, quinine, iron, pepsin, hæmoglobin, glycerophosphates, etc., are in common use. Combined with cod-liver oil, malt extract is of great value. Powdered Malt or Malt Flour is largely used as an addition to the various infants' foods composed of wheaten flour, and the dried Extract of Malt may be given with the food in teaspoonful doses.

Mate (*Ilex paraguayensis*) is the Brazilian holly which contains a considerable amount of caffeine, and is used in Brazil made into an infusion like tea. Its therapeutic properties depend upon the caffeine and tannin contained in its leaves. It has been given with benefit in failing compensation and in migrainous headaches.

† **Menthophenol** is a compound of 1 part of carbolic acid with 3 of menthol, used as an antiseptic. Mentholeate is an oily liquid, used as a local analgesic; it is prepared by dissolving 400 grs. menthol in 1 oz. oleic acid. Menthosol is a 10 per cent. mixture of menthol

and para-monochlorphenol, used as a local application in laryngeal tubercle. Validol is a 30 per cent. solution of menthol in valerianic acid, given in 10 min. doses in sea-sickness.

Menthoxol is a powerful antiseptic liquid, prepared by mixing an alcoholic solution of menthol with a 3 per cent. solution of peroxide of hydrogen ; it is brushed over the interior of the larynx and of the nose in ozæna, or used as a 5 per cent. spray. Camphoroxol and Naphthoxol are prepared in the same way, and have similar properties. They are of 1 per cent. strength ; Naphthoxol is 2 per cent. Diluted with 10 parts of water, they are used as antiseptic dressings for wounds.

Methyl Chloride (Chlormethyl) is a gas supplied condensed in cylinders, and used as a local anæsthetic for minor operations. Upon permitting it to escape it is mixed with air and obliquely thrown as a jet upon the pained part, which it freezes rapidly, depriving it of sensibility. It has been extensively used in sciatica and lumbago. The spray should only be used for a few seconds at a time or eschars may result. Pains and neuralgia of all kinds have been treated in this way by a plan called "Stypage." Pledgets of lint are steeped in methyl chloride, and when laid upon the pained part cause it to freeze. Tetanus has been treated in this way by stypage over the maxillæ and spine.

By saturating chloroform and ether with this gas Richardson's Compound Liquid for general anæsthesia is produced.

Methyl-Violet (Methylrosaniline), known also by the trade name of Pyoktanin, is one of the aniline dyes of very complex and possibly varying chemical composition. It is a weak antiseptic, said to be free from toxic properties, as ordinarily employed, and has been tried as a surgical dressing (1 in 9 boric acid) in cancrum oris, etc., and as an injection (1 in 500) in gonorrhœa, ozæna, and ophthalmia. It was supposed by Mosetig to be capable of curing malignant tumours if injected into their substance (1 per cent. solution), but Quenn proved that it was not diffusible. Ehrlich injected it in sciatica and neuralgia, and a powder of 2 per cent. with sugar has been used to kill the diphtheritic bacillus. Fühner found that it exerts a digitalis-like action upon the heart, but when methylised it forms methyl green, which acts like curare. Methyl violet is changed by free mineral acids into a bright blue or green ; and Mollière, by giving $\frac{5}{8}$ gr. in pill, found that the stools were coloured blue when free HCl existed in the stomach. Auramine is the name given to a yellow-coloured preparation of the drug.

Methylal is a limpid liquid, prepared from methylic alcohol. It is an hypnotic and antispasmodic, lying between ethylic alcohol and ethylic ether ; it reduces arterial tension, produces sleep, and, though it kills by paralysing the heart, it has been suggested as an anæsthetic when mixed with ether. It may be given by mouth in aqueous solution (30 mins.), or by hypodermic injection, or by inhalation. Personali states that it is antagonistic to strychnine. It has been used as an hypnotic in insomnia, and it is claimed to be the best hypnotic in delirium tremens ; and mixed with glycerin and oil or as an ointment (15 per cent.) it has been employed to relieve pain.

Methylene (or M. Bichloride, or M. Dichloride, or M. Chloride, or Dichlormethane), CH_2Cl_2 , is a substance about which much confusion exists. It is a heavy mobile, colourless chloroform-like liquid, introduced as a substitute for chloroform, and it was claimed for it to be safer, especially in abdominal or ovarian surgery. These claims certainly have not been borne out in practice. The drug has been used locally as a spray like methyl chloride, and it is only here mentioned to prevent its confusion with this substance; its use should be abandoned.

Methylene Blue (Tetramethyl Thionine) is one of the aniline dyes. It exists in small greenish crystalline scales, which impart a blue colour to the urine after being swallowed. This drug has been tried successfully, it is reported, in articular and muscular rheumatism, sciatica, and lumbago, in doses of 2 to 3 grs. in pill. Ehrlich found that the pure salt is a valuable means of relieving all forms of pain, especially migraine, and its hypodermic use does not cause smarting. It is stated to be *curative* in migrainous headache and to relieve the pains of ataxia. It has been tried with success in malaria in doses of $1\frac{1}{2}$ grs. 4 to 6 times daily. In similar doses it has been given with alleged success in cancer and phthisis. It has been injected into malignant tumours and enlarged glands, and used in gynæcological practice. It forms a compound with salicylate of soda, called Antirheumatin, which is given in rheumatic fever in 2 gr. doses. It is a valuable application in all forms of stomatitis when applied dry on cotton-wool. Bonnet successfully treats ozæna by a $2\frac{1}{2}$ per cent. solution, and this solution has been successfully used in ophthalmia as a subconjunctival injection, and also as a local application in gonorrhœa, in which disease it has also been employed in cachets or pills. The drug has been used as an intramuscular injection (15 mins. 5 per cent. solution), with the view of testing the condition of the renal tissue; in a healthy man the urine should be distinctly coloured in 30 minutes after the injection. Aniline Blue (Triphenyl-rosaniline) has also been proved to possess specific action in malaria by Iwanoff in 5 gr. doses in capsules or wafers.

Mistletoe, or *Viscum Album*, has been introduced as a remedy possessing qualities similar to digitalis, and beneficial results have followed its use in heart affections and dropsies. It also possesses strong ecboic action. Dose—5 to 30 mins. of a tincture (1 to 8 of spirit). Viscin—its glutinous principle—is known as Japanese Birdlime, and is used as the basis of fly-papers. Viscolan, a purified form of viscin, has been employed as a basis for ointments, and used as a dressing for burns and granulating wounds, and for eczema.

Mollin is a basis for ointments introduced by Kirsten. It is a soft potassium soap containing 17 per cent. of excess of fats, prepared by treating a mixture of equal weights of cocoa-nut oil and lard with 20 per cent. caustic potash, and 4 parts water. After saponification takes place, 17 per cent. fat and 30 per cent. glycerin are added. Liebreich advised 100 of *sapo kalinus* (P.Pr.), 50 to 80 lard, and 10 glycerin; or equal parts of lanoline and *sapo kalinus*. The resulting ointment easily washes off the skin and clothes. It forms an elegant base for mercury, salicylic acid, and the tincture of iodine. This latter, iodine mollin, is a valuable application to

scrofulous glands and diseased joints, and mercury mollin 33 per cent. is used as an external agent in syphilis. Unna's Mollin or salve soap is an almost identical substance containing 12 per cent. excess of fat, in use as an ointment basis.

Monochlor - Phenol (*-para*) exists in colourless needle-shaped crystals, which possess valuable antiseptic properties with analgesic powers, which have been utilized in the treatment of lupus and dental and eye surgery. Langfeldt has recently treated scarlatina successfully by pouring over the patient's body a solution of 1 dr. of the drug in 8 oz. alcohol and 10 oz. ether, the rash and fever rapidly subsiding after a few applications. (See under Para-Monochlor-phenol.)

Monsonia Ovata and *M. Burkei* are South African annual plants of the geranium order, introduced by Maberly, who found them of great value in dysentery. The dose is 1 to 2 drs. of a 1 in 8 tincture. He claims that the average amount of time of 100 cases of dysentery under this treatment was only 2·3 days (90 of these cases were acute).

Morrhual is an acid, bitter, aromatic, yellow liquid, containing the active principles of cod-liver oil—*i.e.*, the phosphorus, iodine, and bromine combined, with organic fatty matters. It is prepared by treating the oil with sodium bicarb., afterwards with hot alcohol, and distilling off the spirit. The morrhual is very much smaller in bulk, and can be easily administered in capsules containing 3 to 5 mins. each. It is not at all probable that the virtues of cod-liver oil are concentrated in this substance, but it can be used in cases where the oil cannot be swallowed. Each capsule of 3 mins. represents 80 mins. of cod-liver oil. Pangaduine is the name given to a solid crystalline body isolated from cod-liver oil, and reputed to contain all its active principles, 1 gr. representing 1 oz. of oil.

Mucin is the active principle of the secretion from the various mucous membranes of animals; it may also be obtained from bile, and is a yellowish-green, tasteless powder, soluble in water. W. S. Low gives it in 10 gr. doses mixed with the same amount of bicarbonate of soda in gastric ulcer at the beginning of a meal, with the view of coating over or shielding the abraded surface during digestion. It has also been employed as a spray in weak soda solution for chronic catarrhal conditions of the upper air tract.

Muscarine is the active principle of poisonous fungi obtained from *Amanita* (or *Agaricus*) *muscaria*—Fly agaric; it can be prepared synthetically. It resembles pilocarpine closely in its action. Thus it causes profuse salivation, perspiration, lachrymation, and gives rise to rather forcible and painful micturition, and sometimes to nausea and diarrhoea. When applied in solution (10 per cent.) to the eye it dilates, and when swallowed it contracts the pupil.

Muscarine is, with the exception of the local mydriatic and anhidrotic effects, a decided antagonist to every action of atropine. Atropine, thus, is the antidote in cases of poisoning with fungi, and the writer has been able to satisfy himself that he has saved several lives by the hypodermic injection of atropine upon an occasion when a large number of school children were poisoned by eating fungi.

Mydrine is a white powder, being a mixture of homatropine and the hydrochloride of ephedrine—the alkaloid of *Ephedra vulgaris* (which see). It is used (10 per cent. solution) to cause dilatation of the pupil; the main advantage of its introduction lies in the fact that it is of greatest use for diagnostic examinations, as the mydriasis passes off in a few hours. The solution acts in 30 seconds, and causes no irritation. It is not to be confounded with Mydrisine, which is the methyl bromide of atropine.

Myrtol is a liquid separated from the oil distilled from the leaves of *Myrtus communis*—the myrtle. It has been employed as an expectorant, in bronchial troubles, in capsules containing 5 mins. 15 mins. have been given with marked benefit in gonorrhœa, leucorrhœa, cystitis, etc. Its power as a disinfectant of the air passages has been demonstrated by Eichhorst, who found the sputum to be disinfected in a few hours in gangrene of the lung after the internal use of myrtol. The leaves of *Myrtus chekan* contain a volatile oil which has similar action as an expectorant in doses of 30 to 60 mins. liquid extract.

Naftalan is an ointment basis consisting of 2·5 to 4 per cent. anhydrous soap blended with pure petroleum naphtha. It is used by Unna in dermatitis and mild eczemas, and has given good results in hæmorrhoids in the form of a suppository or plug on lint and as a liniment in chronic rheumatism.

Naphthalan is the name given to a semi-solid compound, obtained by fractional distillation from Armenian naphtha. It has been suggested as a substitute for tar in skin diseases. It is dirty and liable to irritate, but it has proved useful in scabies.

Naphthalene, or Naphthaline, is obtained in the distillation of coal tar, and exists in the form of a white insoluble crystalline powder, which is a powerful germicide. It is dusted as a powder over ulcers, sloughing wounds, open cancers, and chancres, as well as fresh wounds and stumps, and may be used for disinfecting cavities. After application the part should be covered with oiled silk and bandaged; a 10 per cent. ointment may be used. It is cheap, clean, disinfecting, produces rapid growth of granulations and cicatrices, diminishes irritability and pain, and its application is very simple and easy.

Rossbach recommends it in typhoid fever, diarrhœa, and dysentery, and it has been loudly praised as a remedy of great promise in cholera, though it must be said that many observers deny its value as an intestinal disinfectant. It has expectorant properties, and has been urged as a specific for phthisis. Fenwick speaks highly of it when given in cystitis with fetid urine; it is eliminated by the urine, which it colours brown. It has been praised as a remedy for round-worm and tape-worm. Charren states that the administration of naphthaline may be followed by cataract and amaurosis, whilst many others have proved that it may cause renal disease and destruction of red blood cells, and the internal use of the drug requires caution, and only purest specimens should be given internally. The objectionable odour of the drug has prevented its general use. It is the substance known as Albo-carbon, Camphylene, and Alabastrine.

It is given in 2 to 8 gr. doses in pills coated with keratin. The Tetrachloride has similar action and dosage.

Naphthol—Beta is now official (see p. 252).

Camphorated B.-Naphthol, or Naphthol Camphor, is a syrupy liquid, consisting of B.-naphthol 1 part and camphor 2 parts. It is a powerful and harmless antiseptic for wounds. 2 mins. have been injected in solution with oil into enlarged glands and into the lung in tubercular disease. B.-naphthol Carbonate exists as insoluble crystalline scales. It is the di-naphthylester of CO_2 . It is decomposed by the alkaline secretions in the duodenum, and it is non-irritating, and it has been introduced as a substitute for B.-naphthol.

Microcidine is the name given to a white powder which is made by heating B.-naphthol with caustic soda. It is soluble in less than four times its weight of water. A $\frac{1}{2}$ per cent. solution is a powerful antiseptic for wounds and ulcers, and is devoid of irritating properties. It may be used 2 grs. to 1 oz. as an ointment for ozæna.

Naphthol—Alpha- or Ortho-Naphthol closely resembles and is isomeric with B.-Naphthol. Maximowitsch found that 1 in 10,000 made a solution which completely arrested the growth of various microbes, and he calculated that the lethal dose for a man would be about 20 ozs. It is more irritating than B.-naphthol, and less suitable for internal use. It may be given in similar doses.

Naphthol-Aristol is the Diiodide of B.-naphthol, in the form of a greenish-yellow powder, without odour or taste, and insoluble in water. Introduced as a substitute for iodoform, and as a remedy for various skin diseases, as psoriasis and tinea, in the form of 20 per cent. ointment, it has given promising results.

- For other naphthol compounds see Abrastol (Asaprol), Alpha-oxynaphthoic Acid, Betol, Benzonaphthol, Alphenol, Lactol, Orphenol, Epicarbin, etc.

Narceine is an alkaloid obtained from opium, in white, silky crystals, sparingly soluble in water, about whose value as an hypnotic there has been much difference of opinion. When pure it may be regarded as practically inert; the reports of its narcotic properties were probably owing to an impure alkaloid having been administered. The Meconates of Narceine (*mono*-, and *bi*-) are chiefly employed, and have been given hypodermically. Antispasmin is the name given to a compound of narceine and salicylate of sodium. It is used in pertussis in $\frac{1}{2}$ gr. doses. Narcyl is the hydrochloride of ethyl-narceine, which has some analgesic action in $\frac{1}{2}$ gr. doses, and has been given to allay cough.

Narcotine, when in the pure state, is a crystalline alkaloid obtained from opium, which it is now proposed should be called Anarcotine. It has no narcotic action whatever, but it is an antimalarial agent, and it has been found to cure malaria, which resisted both quinine and arsenic, and to relieve malarial headache, which resisted antipyrine. The dose is 1 to 3 grs. 4 to 6 times a day. In very large doses it will produce excitement with increased reflexes and convulsions like strychnine.

Stypticin, a powerful hæmostatic, is obtained by its oxidation. (See under Stypticin.)

Nervanin is a synthetic cocaine substitute, existing in the form of white soluble crystalline prisms, being the hydrochloride of Diethylglycocoll-para-amido-ortho-hydrobenzoic methyl ester. It is less toxic than cocaine, and more prolonged in its anæsthetic action. It is suitable for hypodermic use, $\frac{1}{2}$ to 1 per cent. solution, and 5 per cent. for dental use. The latter solution causes considerable pain and irritation when instilled into the eye. The drug has marked antiseptic properties.

Neurodin is Acetyl-para-oxyphenylurethane in colourless, odourless crystals, slightly soluble in water. It was discovered by Merck and investigated by Mering. It is introduced as an analgesic, superior to antipyrine in neuralgia, migraine, etc., in doses of 15 grs. in wafer or as a powder. Sometimes profuse perspiration follows its use; it is claimed to be otherwise harmless.

Nicotine is a colourless liquid alkaloid obtained from tobacco. The Bitartrate is a soluble crystalline salt, and has been successfully used in tetanus ($\frac{1}{4}$ to 1 gr.), and as an antidote to strychnine. It has the power when given even in very small doses of enormously increasing the general blood pressure, acting like the suprarenal gland substance, and Schafer suggests that a small dose should be given before chloroform inhalation.

The Salicylate of Nicotine, or Eudermol, in 1 per cent. ointment, is introduced as an antiparasitic remedy in tinea, scabies, etc. It is without odour, and does not stain. It rapidly cures mange in dogs.

Nitrous Oxide.—This colourless, inodorous gas is used as an inhalation to produce general anæsthesia like ether and chloroform. The method by which it produces its effects is still doubtful. It is, however, certain that it affects the cerebral centres, not the peripheries, and it is not decomposed in the system, as some supposed. Only a few deaths have been reported from its use in many millions of administrations. It differs from chloroform and ether in the rapidity of its action and the quickness with which its effects pass off, so that it is only available for very short operations like teeth extraction. The mask must be removed from the face as soon as the cyanotic appearance is seen, and the anæsthesia, which lasts for less than a minute, is recovered from almost as rapidly. Berts' method of prolonging the anæsthesia marks a distinct advance. He administers the pure gas, and keeps up the effect by the inhalation of a mixture of the gas and oxygen by means of a simple apparatus. In this way with safety many operations can be performed where chloroform or other anæsthetic cannot be employed. Hewitt's apparatus is portable and simple.

Nosophen (Tetraiodophenolphthalein) is a pale yellow, odourless, insoluble powder, containing 60 per cent. iodine. The bismuth salt is called Eudoxin and the sodium salt Antinosin. The nosophen compounds are introduced as substitutes for iodoform, and may be used in every case where that drug is indicated. They are given internally as intestinal antiseptics in doses of 5 grs.

Novocain is a synthetic cocaine substitute in the form of a very soluble crystalline powder. It is Para-amido-benzoyl-diethyl-

amino-ethenol hydrochloride. The solutions vary in strength from 5 or 10 per cent. for eye, nose, and throat, to double this for the larynx, whilst for hypodermic use $\frac{1}{2}$ to 1 per cent. and for infiltration anæsthesia $\frac{1}{4}$ to $\frac{1}{2}$ per cent. solutions are employed. They act very rapidly, and their effects are transient.

For spinal anæsthesia 3 c.c. of a 5 per cent. isotonic solution is preferred. The drug is supplied in tablets and in sterilised solution, and is nearly always used in combination with adrenalin.

The dose for internal administration is $\frac{1}{2}$ to 1 gr.

Nuclein, or Nucleol, is a principle of varying and complex composition always containing phosphorus, and generally sulphur, obtainable from yeast, spleen, liver, milk, yolk of egg, etc. The nuclein from yeast, which is chiefly nucleinic or nucleic acid, or its soda salt, is the one most frequently employed. It exists in the form of a white amorphous powder. Nuclein has been stated to be the bactericidal element in human blood, and it has consequently been employed in various parasitic affections, as typhoid, puerperal, and scarlet fevers, diphtheria, phthisis, etc. This bactericidal element is believed to be produced by the white blood corpuscles, of whose constituents it forms a considerable part. When nuclein is administered by the mouth, hypodermically, or per rectum, a great increase in the white corpuscles rapidly follows, and the blood serum is found to be strongly toxic to most microbes. Yeast nuclein is soluble in alkaline solutions; it may be given in doses of 10 grs. in wafer six times a day, or in doses of $\frac{1}{2}$ gr. hypodermically; much larger doses have been given. Glowing reports were published of the improvements and even cures of tubercular disease of the lung. Notwithstanding these glowing accounts, this drug, which was hailed as an "essence of life," has failed to come into general use. Mourek's hypodermic solution is made by dissolving $7\frac{1}{2}$ grs. of splenic nuclein in as much 5 per cent. soda solution as will cause it to dissolve; $7\frac{1}{2}$ grs. carbolic acid are added, and water to 26 drs. Of this from $\frac{1}{4}$ to 2 drs. may be injected. A solution of yeast nuclein of 5 per cent. strength is obtainable, the dose of which is 1 dr.

Yeast is given in doses of a tablespoonful in diabetes and recurring boils. Levurine is a brown powder prepared by dehydrating yeast, and is given in 1 dr. doses. Zymin, Fæxin, and Furonculin are similar preparations.

Nucleic Acid combines with silver, forming Nargol; with mercury, forming Mercuriol; with copper, forming Cuprol; and with iron, forming Ferrinol. Cuprol in 10 per cent. solution has proved most valuable in the treatment of various forms of conjunctivitis. Cup-rargol is a double copper and silver salt of a greyish-white colour, used in 1 to 5 per cent. solution in conjunctivitis.

Nucleotin-phosphoric Acid or Thyminic Acid is obtained from the nucleins present in thymus, spleen, and other glands, and under the name of Solurol is administered in 4 gr. tablets as a solvent of uric acid in gout.

Odolol is a coal-tar derivative closely allied in action and composition to salol. It is a thick yellow oily liquid, soluble in alcohol but not in water, and it is neutral in reaction. Upon the action of a weak alkali it readily splits up into salicylic acid and phenol as salol does. This property renders it a very suitable wash for the mouth and

throat, for which purpose it is dissolved in alcohol and added to water before use. It is powerfully bactericidal, and speedily destroys the germs which flourish in the cavities of decayed teeth.

Orexine is the Hydrochloride of Phenyl-dihydroquinazoline—a bitter, crystalline powder, introduced as a gastric tonic and stimulant to the mucous membrane of the stomach in cases of phthisis where the appetite had entirely failed. It may be given in doses of 4 to 8 grs. in wafers or capsules. Continental reports testify to its power of increasing the appetite (5 gr. doses) in phthisis and after operations, in the vomiting of pregnancy, and in anæmia, but the burning taste of the drug prevents its use in ulcer and acute affections. Tannate of Orexine (Cedrarine) has been employed as a gastric tonic with success in 5 to 10 gr. doses. It is tasteless and unirritating, and has been recommended in 5 gr. doses in sea-sickness and chloroform vomiting.

Orthoform is a synthetic substitute for cocaine, being Methyl-*para*-amino-*meta*-oxybenzoate, a white, bulky, odourless crystalline powder. It has local analgesic properties, and Yonge claims for it several advantages—(1) it is sparingly soluble, hence its action is very prolonged; (2) it is non-toxic; (3) it is powerfully antiseptic. On the other hand, it has no action on the unbroken skin and little on a healthy mucous membrane, its effects being only strikingly shown where there are nerve endings exposed. The drug is poisonous when injected, but not when applied to mucous membranes, and it can be given internally in large doses with safety. The powdered orthoform may be sprinkled over abraded areas alone or mixed with lycopodium, and it has been applied with success in ulcerations of the upper air passages not requiring operative measures. A 10 per cent. ointment, or a 10 per cent. solution of the hydrochloride, or a 5 per cent. spray of the latter may be used. Good results have been obtained by 3 to 5 grs. given in cancer and ulcer of the stomach, when the relief of pain is said to have lasted from 4 to 30 hours. It has also given satisfaction in gonorrhœa, gynecological practice, cystitis, burns, and a host of other painful conditions.

New Orthoform differs slightly in chemical composition, and is now chiefly in use. It is *Meta*-amido-*para*-oxybenzoic acid.

Oubaïn is the name of a crystalline glucoside extracted from the Somali arrow poison, obtained from *Acocanthera Ouabaïo* and allied species. The glucoside is believed by Arnaud to be identical with strophanthin, and acts powerfully upon the respiratory and cardiac centres. It is, however, stated to be twice as poisonous and twice as rapid as the glucoside from strophanthus, and like strophanthin, it acts more slowly when taken by the stomach. It acts on the conjunctiva like cocaine, and produces anæsthesia.

Gemmell recommended this glucoside in whooping-cough, and he claimed for it that it shortened the first and second stages of the disease, and diminished the length of the convalescent stage, in doses of $\frac{1}{1000}$ gr. to children 5 years old; in some cases he increased the dose to $\frac{1}{250}$ gr.

There is much confusion about this remedy, and Merck has changed the name of Lewin's Ouabaïn to Ouabaid, to prevent its

being mistaken for this ouabain of Arnaud. Commercial ouabain is also obtained from several other species of *Acocanthera* and from *Strophanthus glabrus* from Gaboon. Fraser's crystalline glucoside is obtained from *Acocanthera Schimper*; it is identical with Arnaud's, and he proposes to call them both Acocantherin instead of Ouabain. Pure Strophanthin should not be given in doses exceeding $\frac{1}{120}$ gr. The liquid extract (1 in 1) of *A. venenata* is given in 3 min. doses.

Oxygen as a therapeutic agent has undergone many vicissitudes of fortune, at one time being regarded as a universal panacea for all blood ailments, and at another time falling into discredit. Thanks to the brilliant researches of Lorrain Smith, of Haldane, and others, the application of the laws of the pressure of gases to pharmacological research is clearing up the question of the value of oxygen. At ordinary atmospheric pressure the addition of large quantities of pure oxygen to the air produces no symptoms when breathed for long periods by healthy subjects, but when the pressure is increased the gas acts as a poison to the nervous system, and as a fatal irritant to the lung. Under ordinary conditions of life the hæmoglobin of the blood is always practically saturated with oxygen, and the addition of this gas to the air breathed, or the substitution of the pure gas, cannot alter its composition, but the amount of oxygen in simple solution in the blood can be increased five-fold by inhalation of the pure gas at ordinary pressure. It is calculated that by breathing the pure gas an increase of 70 per cent. of oxygen is available for the supply of the cerebral tissue and 40 per cent. for the body tissues. In poisoning by carbon monoxide, coal gas, etc., the serious change in the hæmoglobin causes death, and the writer has satisfied himself that he has saved life in desperate cases of coal-gas poisoning by the persistent use of oxygen for several hours. In pneumonia, acute bronchitis, cardiac dyspnoea, and allied conditions, the effect of the gas is often very striking, the cyanosis rapidly disappearing sometimes, and by maintaining the patient's life during a severe crisis, time is given for the elimination of poisons, and life may be occasionally saved, though it must be acknowledged that the efficacy of the remedy is greatly exaggerated by many authorities. Oxygen is stated to be of great value in lowering excited reflex activity in puerperal eclampsia. It has been used with success in the treatment of strychnine and morphia poisoning, drowning, laryngeal diphtheria, and with benefit in some forms of leukæmia, extensive burns, lithiasis, and other conditions.

The compressed gas is supplied in metal cylinders, from which a rubber bag can be filled as required, and the patient slowly inhales from the bag or direct from the cylinder. Ozone or ozonised air has identical action, but is more irritating. A small jet of oxygen has been found to produce remarkable improvement in slowly healing ulcers, carbuncles, and foul wounds, and Stoker's plan of treating chronic ulcers with diluted oxygen has given most valuable results; he shows that the resulting cicatrix is superior to that obtained in any other way. Hydrogen Peroxide, Ozonic Ether, Magnesium and other Peroxides are administered by the stomach in diabetes, uræmia, whooping-cough, and bronchial troubles, with the idea of increasing the amount of oxygen in the blood.

Papain, or Papayotin.—Papain is the soluble ferment prepared from the juice of *Carica papaya*; it is in the form of a white powder. It possesses the power of digesting animal substances: 1 gr. will peptonise 200 grs. pressed blood fibrin. Papayotin is, strictly speaking, the milky juice obtained by incisions made into the unripe fruit, collected and dried. The words papain and papayotin are, however, now used synonymously. In the West Indies the papaw juice is used to render the toughest meat quite soft and digestible.

The ferment will act in an acid, neutral, or alkaline medium, which gives it great advantages over pepsin. Moreover, the action of papain continues all down the intestines, whilst that of pepsin ceases in contact with the alkaline juices, and the drug has a certain amount of anodyne or pain-relieving power. It has also been used as a remedy against round and tape worms, which it sometimes has destroyed by its digestive action. It has been used with varying success as a local remedy in diphtheria, where its application as a powder causes the disintegration of the false membrane. It has also been employed to destroy warts, epitheliomas, etc. Schwimmer has successfully used a solution (1 in 10) to cure fissures of the tongue. It is a powerful galactagogue when given internally, or even applied locally. The writer has satisfied himself of the great value of Finkler's papain in dyspepsia, chronic gastritis, ulcer, and cancer of the stomach in doses of 2 to 3 grs. He obtains such excellent results with the drug that he seldom now uses pepsin. He combines it with bicarbonate of soda, carbonate of bismuth, and a little morphia. There is no other combination which will give so good results in many gastric affections as this:—Papain, 3 grs.; Sodæ bicarb., 30 grs.; Mag. c. pond., 20 grs.; Bism. carb., 10 grs.; Morphiæ hydrochlor., $\frac{1}{18}$ gr. The drug can be given in tablets, with or without soda, and as Glycerinum Papain of any strength. Creosote does not interfere with its gastric action.

The leaves contain a poisonous alkaloid called Carpaine (which see).

Papain is not to be confused with Papine, which is the name given to a proprietary liquid professing to contain the anodyne properties of opium free from its objectionable alkaloids.

Paraform (Trioxymethylene), or Paraformic Aldehyde, or Tri-formal, or Polymeriform, is the polymerised form of formic aldehyde or Formalin (which see). It has been recommended as an intestinal antiseptic. It exists as a white crystalline powder, and may be given in doses of 10 to 15 grs. It causes colic, and the use of the drug is now practically confined to the disinfecting of sick rooms and surgical appliances by heating it in a spirit lamp, when formic aldehyde is formed. Paraform has been used as a disinfectant for catheters. Unna uses a collodion containing paraform for disinfecting the skin in diseases like pityriasis versicolor. Sterilisol is the name given to a solution of paraform prepared *in vacuo*, and used for disinfecting purposes.

Para-Monochlorphenol is a crystalline salt, which Karpow affirms is the potent antiseptic of the aromatic series. It is often called Chlorphenol, and is used as an ointment (10 grs. to 1 oz.) applied in erysipelas. It reduces the temperature, and in a few days all red-

ness and swelling disappear. Ortho-monobromphenol or Bromophenol—a violet-coloured liquid—acts in the same way, and may be used in the same strength. 5 to 20 per cent. solutions of monochlorphenol in glycerin have been applied in tubercular ulcerations of the throat and larynx. Elsenberg paints the melted drug (104° F.) on lupus, and dresses the ulcer with a 25 per cent. paste or ointment, which is removed after 12 hours. Brilliantoff treats corneal ulcers and iritis by injecting a 1 per cent. solution under the conjunctiva, and Köhler obtained excellent results by plugging the putrid pulp cavities of teeth with the drug. 2 per cent. solutions are recommended as the best means of disinfecting tubercular sputa. The salicylates of parachlorphenol and orthochlorphenol, called respectively Parachlorsalol and Chlorsalol, are used as intestinal antiseptics in 20 gr. doses. Logucki uses a mixture of parachlorphenol and menthol (5 to 15 per cent.) under the name of Menthosol for laryngeal and other cases. Its taste and smell are not objectionable.

Under the name Chlorphenol there is a liquid in use consisting of monochlorphenol, alcohol, eugenol, and menthol for inhalation in phthisis.

Pelletierine or Punicine is an alkaloid obtained from the bark of the pomegranate. The bark contains four alkaloids or pelletierines, only two of which are possessed of any anthelmintic action, and it is chiefly Pelletierine sulphate and tannate which are used in medicine in doses of 6 grs. each. Von Schröder has demonstrated the action of this remedy outside the body upon living specimens of *tænia*; he found the addition of $\frac{1}{10000}$ part of pelletierine to the fluid containing the parasites caused their death in a few minutes. When tannin is not given the soluble sulphate is absorbed in the stomach and fails to kill the worm, and giddiness, dimness of vision, muscular weakness, and twitchings are noticed, which do not follow the dose of the mixed substances.

The drug has been injected in Ménière's disease, tetanus, and paralysis. A smart purge of jalap should be given after the anthelmintic dose to expel the dead worm, and the stomach and bowel should be empty before its administration.

Peronine is a white soluble powder, being Benzylmorphine hydrochloride, introduced by Mering as a narcotic less objectionable than morphia. It induces sound sleep without previous excitement, and it relieves pain with less of the drawbacks following morphia. The dose is about that of morphia, and it is very suitable as a sedative to the respiratory centre in the cough of various diseases, especially of tuberculosis. A 1 per cent. solution applied to the conjunctiva acts like cocaine.

Peruol is a 1 in 4 solution in castor oil of Peruscabine (benzoic benzyl-ester), which is the active principle of Peruvian balsam. It is used as an ununction in scabies, and is said to be most efficacious without producing irritation of the skin.

Petroleum, or Rock Oil, found in geological strata, and resulting from the decomposition of animal matter, is chiefly of interest on account of the large number of bodies derived from it, and which

have a place amongst remedial agents. Thus Naphtha is the liquid portion which distills over below 122° F.; from this are obtained by fractional distillation still more volatile liquids known as Benzine, Petroleum Ether, Rhigolene, Ligroin, etc. Vaseline, Petrolatum, or Soft Paraffin, is the semisolid mixture of hydro-carbons, which is obtained by purifying the residue after distilling off the naphtha and benzin liquids. It is known in commerce as Vaseline and White Vaseline, and by a variety of names, as Geoline, Ozokerine, Chrisma, Cosmoline, Adepsine, etc.

Many non-official ointment bases are in use made from different paraffins. Thus, the Parenols consist of vaseline made into a permanent emulsion with lanoline and water. Liquid Parenol is of similar composition, being made with liquid paraffin.

Vasenol is a similar basis, prepared by emulsifying vaseline with water by the addition of spermaceti. The Oleogens are mixtures of yellow petroleum oil and oleic acid treated with ammonia, to which agents like guaiacol, menthol, iodine, etc., can be added; the Parogens are similar preparations made with liquid paraffin.

Vasogen, Valsol, or Oxygenated Vaseline, is a yellowish-brown, thick liquid, used as an ointment basis for creosote, ichthyol, menthol, iodine, iodoform, etc.

A fluid (vaseline oil) obtained from petroleum is used as a vehicle for hypodermic injections, and as a spray in laryngeal troubles.

Liquid paraffin is now official. The pure liquid paraffins are demulcents, and are used as the basis of various popular cough emulsions.

Commercial Petroleum is a popular counter-irritant in rheumatism, and an antiparasitic remedy in various skin diseases. It is a valuable stimulant to the scalp in baldness, alone or diluted with 2 to 5 times its volume of any oil. The writer uses a mixture of 1 part of petroleum and 3 of olive oil as a routine application to the hair of the head in Charity Schools to destroy pediculi, as well as to prevent their appearance. Sapolan is an ointment consisting of naphtha, lanoline, and soap, which may be used in the same way. It is valuable in eczema, prurigo, and urticaria.

Phenocoll (Amido-acet-para-phenetidin hydrochloride) closely resembles phenacetin, chemically and therapeutically. It is a soluble, white crystalline powder, and has been used in all the conditions in which antipyrine has been employed in 5 to 10 gr. doses. It has very decided action in neuralgia, rheumatism, and pertussis. It can be sprinkled over wounds and ulcers as a substitute for iodoform, and it is also stated to be an intestinal antiseptic, but it is probably too soluble to have any local action. Salocoll is the salicylate of phenocoll, and is recommended in rheumatism; it is less soluble, and may be taken in wafers in doses of 15 to 20 grs.

Phenolphthalein is Dihydroxy-di-phenyl-phthalide, long used as a test for alkalis. It has attracted much interest since its purgative properties have been accidentally discovered, and it is now reintroduced under the names of Purgen, Laxoin, Aperione, Laxatol, and Laxen as a synthetic purgative allied to the anthracene group. It is a white crystalline powder, administered in 5 gr. tablets. In the intestines it is converted into the soda salt, which diffuses with

great difficulty, causing by its irritation mild purgation without being absorbed. It is not to be confounded with Purgatin, which see.

Phesin is a pale, brownish-yellow, amorphous, soluble powder without odour, and with a strong saline taste. It is a derivative of phenacetin, and it acts in the same way, only more promptly, and like almost every drug introduced as an antipyretic it is vaunted as being absolutely devoid of toxicity, in doses the same as phenacetin.

Phloridzin is a glucoside, existing in silky crystals, obtained from the bark of the apple, cherry, pear, and plum tree. It is of interest chiefly owing to its being employed in the physiological laboratory, as an agent, which readily produces glycosuria or diabetes of short duration. It is said to be antiperiodic, and has been used in ague, like quinine, in similar doses.

Phytolacca Decandra, or Poke Plant, is affirmed to be a specific in chronic rheumatism, scrofula, and syphilis, many skin affections, diphtheria, and inflammations of the mammary and thyroid glands. It is in full doses narcotic and emetic, and produces purging, and has been given in bronchial troubles. It appears at the best a rather dangerous remedy, and should not be given in doses of more than 5 to 10 mins. liquid extract (1 in 1). The powdered root has been applied to burns and eczema (1 to 8 lard). The powdered extractive known as Phytolaccin has been used as a cholagogue in liver diseases in doses of 2 to 3 grs.

Pichi (*Fabiana imbricata*) consists of the young branches, which are powerfully diuretic and tonic. Its use is contra-indicated in advanced renal diseases. In chronic catarrh of the bladder and in cystitis, accompanied by calculi and gravel, this drug has been much prized in Chili, and Fenwick found it to possess considerable power over the hæmaturia and pain in renal calculus. Shoemaker states that, given in combination with an alkali, it holds uric acid in solution, and it is thought that its resin dissolves the mucus which binds together the particles of a stone, leading to disintegration and facilitating expulsion. It has been given in gonorrhœa and nocturnal enuresis. Dose of fluid extract (1 in 1), $\frac{1}{2}$ to 1 dr. ; infusion (1 in 20), 2 ozs.

Piperazine is an alkaloidal body occurring in colourless, acicular crystals, very soluble in water, prepared synthetically from ethylenediamine, and was formerly known as Ethylenimine, Diethylenediamine, or Dispermine. It was at first introduced under the name Spermine, having been considered to be identical with that body, but it has nothing in common with it.

It behaves in a remarkable manner with uric acid. In cold aqueous solution it dissolves *twelve* times as much uric acid as carbonate of lithium does under identical conditions, and the piperazine-uric acid compound is seven times more soluble than the lithium-uric acid combination. It is claimed that 1 part of piperazine and 1 part of uric acid dissolve in less than 1 dr. of water, whilst it requires nearly 1 oz. of water to dissolve the same quantity of uric acid lithium (the exact proportions being 50 and 368 parts). Even when the uric acid is in great excess piperazine forms the very

soluble neutral salt, and never an acid salt. Notwithstanding these remarkable solvent properties, the drug has failed to support the glowing reports of its virtues in gout, calculi, rheumatism, etc. In the amount in which it is eliminated by the urine it has no solvent power over calculi, as formerly stated. It is of use in gout, probably through its diuretic action.

An injection (5 per cent.) into the bladder has been recommended as a solvent of uric acid calculi, and 1 per cent. solutions have been injected in gonorrhœa and cystitis.

It is non-caustic and harmless, and may be given hypodermically in doses of 5 grs., or by the mouth 10 grs., three times a day in a large quantity of plain or aerated water. A compound containing lithium, under the name Lithio-piperazine, is taken in doses of 10 grs.

The neutral and the acid Glycerophosphates are white granular powders, soluble in water, and given in 5 gr. doses. The Salicylate and Benzoate are practically identical in dosage and action with piperazine. Lycetol is the Dimethyl-piperazine tartrate, and resembles therapeutically Lysidine, which is Ethylene-ethenyldiamine in 50 per cent. solution. There is also an Acid tartrate of lysidine given in 10 gr. doses.

Pilocarpinæ Phenas is a colourless, oily fluid, which has been used by Edson with the view of introducing phenol into the blood. He maintains that, in addition to its expectorant qualities, it produces leucocytosis in phthisis. He uses a solution called Aseptoline, consisting of 1 gr. of carbolate of pilocarpine in 10 ozs. carbolic acid solution (2·75 per cent.). About 1 dr. of this is injected into the abdominal wall. This treatment is vaunted to cure malaria also, and that more effectually than quinine. The Salicylate of Pilocarpine has similar action. Bromocarpin is the name given to a syrup containing bromide of potassium, combined with pilocarpine, introduced as a remedy for epilepsy.

Piperine is obtained from *Pip. longum* and *nigrum*, in colourless or pale yellow, odourless crystals, which have been recommended as a substitute for quinine in the treatment of intermittent fevers. It has, however, been supposed that its antiperiodic virtues depend upon impurities. It is, nevertheless, decidedly antipyretic. It possesses all the therapeutic virtues of pepper, and has been given in gonorrhœa, dyspepsia, hæmorrhoids, etc., in doses of 5 to 15 grs.

Piperidine is a colourless liquid, obtained from piperine or synthetically from pyridine. It forms an acid tartrate and a guaicolate (Guaia-perol), both white crystalline substances, given in 10 to 20 gr. doses as uric acid solvents. The Benzoate of piperidinpara-sulphamine mixed with potassium bicarbonate, under the name of Calcosol, is employed as a gout cure in effervescent form.

Piperonal, or Piperonylic acid aldehyde, or Heliotropin, exists as fine prismatic, colourless crystals, with a strong vanilla-like odour, which are insoluble in water. It is obtained by the oxidation of piperine, and is a powerful antiseptic, though harmless, and may be given in doses of 15 grs. in wafers.

Piscidia Erythrina, or Jamaica Dogwood root bark, has been used as a substitute for opium; it causes sleep in moderate doses, which is not followed by any of the after ill effects of opium. It relieves

pain in sciatica and neuralgia, though it is generally experienced that its anodyne influence is less than that of opium, whilst its hypnotic power is greater. It relieves cough in phthisis, though the drug has practically fallen into disuse. 1 dr. of the liquid extract (1 in 1) is the dose.

Protargol (Silver Protein) is a chemical compound of silver and protein substance, and contains 8 per cent. silver. It is very soluble and highly penetrating, and is not precipitated by albumin, and is practically non-irritating. Many reports show that it is a very efficacious remedy for gonorrhœa when injected in $\frac{1}{2}$ per cent. solution three times a day, increased to 2 per cent. 20 per cent. solution is vaunted as a certain prophylactic against gonorrhœa. It is a powerful antiseptic, and has been employed as a dusting powder for wounds of all kinds, and it has found use extensively in eye surgery, and as an inunction (20 per cent. in lanoline) in ulcerative endocarditis.

Purgatin, or Purgatol, is Anthrapurpurin diacetate—a yellow, tasteless powder, insoluble in water, belonging to the oxyanthraquinone series, and of much interest, as being the first synthetically prepared purgative (see also Phenolphthalein). It produces semisolid motions in about 8 to 12 hours after doses of 10 to 15 grs., and as a rule only one motion follows a single dose. It resembles in its composition and action the active principle of senna, aloes, cascara, rhubarb, and other anthracene purgatives; it stains the urine red. Mucogène in 5 gr. doses and Exodin in 15 gr. doses are similar oxyanthraquinone derivatives.

Pulsatilla, or Meadow Anemone.—Under this name are included *Anemone pulsatilla* and *A. pratensis*. Shapter concludes that it acts by controlling irritability and over-activity of the ganglionic nervous system, and has no claim, except indirectly, to be classed with hellebore and aconite as a vascular sedative. It has been given in spasmodic catarrhal affections of the bronchi and other mucous surfaces and in spasmodic dysmenorrhœa. In acute epididymitis, 2 min. doses of the tincture every 2 hours have given good results. The fresh leaves are powerfully irritant, and may even blister the skin when applied to the sound cuticle. Anemonin, or Pulsatilla Camphor, its active principle, may be given in doses of $\frac{1}{10}$ gr. in pill, or the tincture (1 in 10), 5 to 20 mins. in water.

Pyocyaneus-Protein is a fragrant yellow liquid, obtained by treating cultures of *Bacillus pyocyaneus*. It has been extolled as a remedy for ulcers of the leg when applied on lint or gauze. It is claimed to be absolutely harmless, and that it changes rapidly the action in chronic ulcers, which heal speedily after its application. Pyocyanase—a ferment obtained from the same bacillus—is a similar or identical liquid, which has been successfully sprayed into the throat and nasal cavities in diphtheria and other septic affections.

Pyramidon is a white tasteless powder, being a substitution compound of antipyrine. It is Dimethylamido-antipyrine. Its action may be regarded as almost identical in doses of one-third of those of antipyrine. 5 grs. will dissolve in 1 dr. of water, and may be given as an average dose in migraine, neuralgia, asthma, etc. The fall in the temperature produced by it is more gradual and of longer duration than in the case of antipyrine, and in phthisis it is found

that one daily dose of 8 or 10 grs. will prove enough to regulate the fever heat for considerable periods. 45 grs. may, however, be given in one day with safety. The Camphorates have been recently introduced; they are given in similar doses, but are said to be contra-indicated in diabetes. Trigemini is the name given to its butyl-chloral salt, given in 10 gr. doses for facial neuralgia. Tussol is Antipyrine Amygdalate—a white crystalline soluble salt given in 5 gr. doses in spasmodic bronchial troubles—asthma and pertussis. Salipyrin or Antipyrine Salicylate is a white, sparingly crystalline salt, resembling Tolipyrin (Tolylantipyrin), which contains a methyl molecule. Both substances are recommended in 10 to 20 gr. doses in rheumatism and neuralgia. The Salicylate of Tolipyrin has similar action and dosage.

Pyrantin is Para-Ethoxyphenyl-succinimide, and its sodium salt is called Soluble Pyrantin. It is an antipyretic, and, like every new member of the group, it is heralded by the statement that it reduces fever heat without any drawbacks. It is given, 5 to 10 grs. every 4 hours, in acute rheumatism, and it has been tried in tubercular disease, but with disappointing results, and will probably never come into general use. It is related to Triphenin, which is a derivative of Para-phenetidin and propionic acid, and also to Phesin.

Pyridine is a substance existing in tobacco smoke, and which may be obtained by the dry distillation of nitrogenous carbon compounds, or by the action of sulphuric acid upon bone-oil and subsequent fractional distillation. It is supposed to be the active principle formed on the ignition of the various asthma cures. Merck's Pyridin is a colourless, powerfully smelling liquid. It has been used with striking benefit in asthma. The vapour being inhaled after spontaneous evaporation, in a few minutes the breathing becomes easy, the pulse falls, and sleep follows. In chronic cases the patient may spend half an hour in a small room where 3j. pyridin is placed on a plate three times a day. It is also used in angina and pertussis, in 5 to 10 min. doses, and an injection (1 min. in 5 ozs.) has been used in gonorrhœa.

This substance is not to be confused with Pyrocin, which is Acetyl-Phenylhydrazin—an antipyretic containing 25 per cent. of hydracetin.

Quinaphthol is a yellow crystalline powder, being the β -Naphthosulphonate of quinine. Riegler finds this to be the best of all intestinal antiseptics. It passes through the stomach unaltered, and is split up in the duodenum. It is claimed for it to be perfectly harmless, and may be frequently given in cachets, in doses of 10 grs. It has been recommended in typhoid fever, tubercular peritonitis, and acute rheumatism.

Quinetum consists of a mixture of the alkaloids obtained from the red cinchona bark. It possesses all the properties of the bark; its astringency is, however, feeble. It is a cheap substitute for quinine, and has been used in ague, fevers, and all affections in which quinine has been valuable. It is not so presentable as quinine, owing to its dirty white appearance. The sulphate of quinetum, however, is a more elegant preparation, and may be given in the same doses as quinine.

Quinine Salts.—Many non-official quinine salts are in use, the following being the best known :—

Quinidinæ Sulphas is the neutral sulphate of an alkaloid prepared chiefly from *C. pitayensis*, in white silky crystals, not so bitter as quinine, and less expensive. This salt is very suitable for administration to children, who do not object to its taste so much as to quinine. The Tannate has identical action, and is almost tasteless. Dose—Same as quinine.

Quinoidine, or Chinoidine, is the brown resinous residue left after the removal of the crystalline alkaloids from cinchona liquid. It is used as an inexpensive remedy for malaria in 5 gr. doses.

Quininæ Albuminas is a white amorphous substance with alkaline reaction, soluble in water, and containing 54 per cent. of quinine and 46 of albumin.

Quininæ Arsenas is a crystalline powder, given in doses of $\frac{1}{8}$ to $\frac{1}{2}$ gr. in the sequelæ of malaria ; it contains 29 per cent. arsenic acid. It resembles in action Quinine Arrhenalate, which is the salt of methyl arsenic allied to the New Cacodyle.

Quininæ Carbonic Ester is known as Aristochin, or Aristoquinine ; it is a tasteless white powder, containing 96 per cent. quinine, and is given in malaria in 10 to 15 gr. doses. Chinaphenin is the tasteless phenetide of the above given in similar dosage.

Quininæ Citras and Q. Chloras are both very slightly soluble, and are given in pilular form in 4 gr. doses.

Quininæ Eosolate (quininate of trisulpho-acetyl-creosote) is introduced as a neutral salt for the treatment of malaria, in 3 gr. doses in pills.

Quininæ Ethyl Carbonas, known as Euquinine or Euchinine, is an almost tasteless crystalline powder, introduced as a substitute for the bitter salts. It is sparingly soluble in water, but its hydrochloride is soluble, and is given in 10 gr. doses. Euquinine itself is soluble in water on the addition of an acid. Celli has obtained excellent results by using it as a prophylactic against malaria in 4 gr. doses, morning and midday.

Quininæ Ferri-Chloridum exists in reddish-brown, soluble scales or powder ; it is introduced as a valuable hæmostatic in hæmorrhages in doses of 3 grs. four or six times a day in wafers.

Quininæ Formas (Chinoform) is the basic formate, used hypodermically in 3 gr. doses.

Quininæ Hydrochlorsulphas and the Hydrochlorphosphas are introduced as hypodermic salts, being soluble in their own weight of water.

Quininæ Fluoridum is vaunted in $\frac{1}{2}$ gr. doses for enlarged spleen, and

Quininæ Iodidum, the Acid Iodide, Iodate, and Periodide in 2 to 5 gr. doses in tuberculosis, chronic syphilis, and chronic rheumatism.

Quininæ Glycerophosphas is indicated in the obstinate neuralgia of chronic malaria in doses of 5 grs. four times a day. It is known as Kineurine. Phytin Quinine is mentioned under Acid. Glycerophosphoricum.

Quininæ Hydrobromidum exists in colourless, lustrous needles, which contain nearly 80 per cent. quinine. It is claimed for this

salt that large doses can be tolerated without cinchonism resulting. The *Acid Hydrobromide* (yellow crystals) is more soluble than the above, which is neutral. 1 dr. of water will dissolve 10 grs. of it. Where quinine cannot be given by the mouth this salt can be readily employed hypodermically. A very much smaller dose is necessary when injected into the subcutaneous tissue. It produces, whether taken by the mouth or injected, less unpleasant symptoms than the other quinine salts. In chronic malaria hypodermic injections of 3 grs. dissolved in 20 mins. of warm water have proved valuable.

Quininæ Lactas is very suitable for hypodermic use in 1 in 10 of water.

Quininæ Lygosinas is the diortho-oxydibenzylacetate of quinine—a red powder, given in 3 gr. doses, and applied locally as a medicated gauze to ulcers and wounds.

Quininæ Oleatum is 1 part of the alkaloid dissolved in 3 of oleic acid for external use, and for mixing with cod-liver oil.

Quininæ Phosphas is a salt of varying composition, resembling in nearly every respect the official sulphate, and very sparingly soluble in water. The Hypophosphite contains 83 per cent. quinine, and is also very sparingly soluble in water.

Quininæ Salicylas exists as white silky needles, very sparingly soluble in water; it is best prescribed in the form of 4 gr. pills. Saloquinine is the tasteless quinic ester of salicylic acid, used in 15 gr. doses in neuralgia. The following substance is its salicylate:—

Quininæ-Salicyl Salicylas, known as *Rheumatin*, is extolled as a remedy in acute rheumatism and its complications, in doses of 15 grs. three or four times a day. It is a white, tasteless, crystalline powder. The *Acetyl-Salicylate* known as *Xaxaquin* is an unstable compound given in 5 gr. tablets in rheumatism.

Quininæ Sulphocarbolas is a whitish powder, prepared by mixing hot solutions of sulphate of quinine and carbolic acid, and may be given in pill in doses of 2 to 8 grs. It resembles the Carbolate or Phenate and the Camphorate in dose and action.

Quininæ Tannas exists as a yellowish-white, almost tasteless, amorphous powder, prepared by decomposing sulphate of quinine solution with strong solution of tannic acid. It is recommended for children. Its dose corresponds to that of the sulphate, but it is nearly insoluble.

Quininæ Valerianas exists in white, lustrous crystals, smelling slightly of valerianic acid. In addition to the valuable properties of quinine, this salt possesses superior power over *neuralgia* in hysterical patients. The dose should not exceed 3 grs. and should be given in pill.

Quininæ et Ureæ Hydrochloras, or the *Hydrochloro Carbamide*, is a soluble hydrochloride of urea and quinine salt, suitable for hypodermic injection; it contains nearly 60 per cent. quinine. It may be easily prepared by combining 3 parts of urea with 20 of hydrochloride of quinine and 12 of hydrochloric acid. It dissolves in its own weight of cold distilled water, and the solution can be injected in 5 to 20 min. doses. (The salt of urea and quinic acid is known as *Quinate of Urea* or *Urol*. It is not suitable for hypodermic use, but is given in 5 to 10 gr. doses in gout.)

Quinine Urethane is the Ethyl Carbamate; a very soluble salt used for hypodermic injection in doses of 3 grs., not to be confused with the Ethyl *Carbonate* (Euquinine).

☞ These hypodermic salts are now superseded by the introduction of the acid hydrochloride into the new B.P.; it dissolves in less than its own weight of water. Bacelli, for his solution for intravenous injection, gives 15 grs. with $11\frac{1}{2}$ grs. sodii chlor. and 150 mins. of water. The Bisulphate is only soluble 1 in 10, and hence is unsuitable. See also Sidal, Acid. Quinicum, Quinotropine, Hydroquinone (Quinol), etc., etc.

Radium—the new element obtained from Pitchblende residues—has attracted much attention of late as a therapeutic agent. The bromide is the salt usually employed in hermetically sealed glass tubes, or in “applicators,” in the form of buttons of ebonite having a thin sheet of aluminium or mica in front. The α , β , and γ rays constantly given off possess remarkably active properties, but it is the β rays which are believed to possess the wonderful virtues which have been demonstrated in this new therapeutic agent, though they possess only one-hundredth part of the penetrating power of the γ rays. A 5 milligramme tube brought into contact with small patches of lupus, rodent ulcer, or epithelial cancer, and permitted to remain for half an hour or more for several occasions at a week or two's interval, has been found to effect permanent cure. Cancer of the bladder, uterus, and œsophagus has been reported as cured by the application of the remedy in suitably devised applicators, and in ophthalmic practice trachoma and obstinate ophthalmia have been caused to yield to similar treatment. The effects resemble generally those produced by X-ray treatment without the dangers of serious dermatitis. The inhibitory action of radium rays on the growth of bacteria leads to the hope that this agent may prove efficacious in the treatment of tuberculosis and many other parasitic affections.

Resaldol is a derivative of resorcin in the form of a brown insoluble powder, prepared by acting upon resorcin with chlormethyl-salicylic aldehyde. It is introduced by Herrmann as an ideal intestinal antiseptic, being insoluble in acids, and easily soluble in alkaline solution. The drug has been given with success in tubercular ulceration of the bowel in 15 to 20 gr. doses.

Resorcin, or Resorcinol, is Metadihydroxybenzene, occurring as a white, soluble, crystalline powder, resembling carbolic acid in its properties, being a powerful antiseptic. 1 in 100 prevents putrefaction; 2 in 100 is not irritating when applied to wounds. Given internally large doses (30 grs.) cause giddiness, dyspnœa, and perspiration; 60 grs. have caused collapse and coma and a fall of temperature, but its use as an antipyretic is dangerous. 5 gr. doses have been given in ulcer of the stomach and in sea-sickness.

In the diarrhœa of children small doses (1 gr.) have achieved good results. It has been given in ague and asthma, but the large doses which are necessary are dangerous.

It acts as a local anæsthetic in laryngeal cases, and if applied in concentrated form it becomes a safe and painless caustic in tubercular laryngitis.

Externally or locally it possesses great absorptive powers over new cell infiltrations, as lupus, epitheliomas, etc. In labial epithelioma the powder causes speedy cicatrisation, and even in uterine and rectal cancer benefit is for a time noticed when the powder is dusted over the growths, where it acts as an efficient painless cauter; the strong solution is also caustic. Excellent results have been obtained in whooping-cough by using a spray or painting the throat and fauces with a 1 to 2 per cent. aqueous solution. In both this disease and diphtheria it may be administered internally at the same time. A solution (1 in 20) may be injected into the bladder in cystitis, and a 1 to 2 per cent. solution may be used in ophthalmia, otitis, gonorrhœa, and leucorrhœa. Externally the same solution is of great value in chronic eczema, ulcers, wounds, and sores. 2 to 5 per cent. in erysipelas, and 20 per cent. in psoriasis and parasitic skin diseases have been valuable. It must be absolutely pure, and should be kept from the light.

Euresol is the monoacetate of resorcin ; it is a soft, oily mass or paste suitable for external application in all cases where resorcin is indicated.

Anusol is the Iodo-resorcin-sulphonate of bismuth introduced as a remedy for hæmorrhoids when used in the form of a suppository.

Resorcin Camphor is a liquid formed by heating together resorcin and camphor ; it possesses strong antiparasitic properties which have been utilised in tinea and pediculi of the scalp.

Thio-resorcin and Di-iodo-thio-resorcin are amorphous powders, the former of a pale yellow and the latter of a brown colour. They are insoluble compounds of resorcin and sulphur which have been introduced as odourless substitutes for iodoform.

Resorcinol is also the name given to a brown powder formed by mixing and heating equal parts of resorcin and iodoform. It is introduced as a substitute for iodoform, and may be mixed with 3 or 4 times its weight of starch, and dusted over chancres and ulcers.

Resorcin-phthalein Anhydride, or Fluoresceïn, or Tetraoxyphtalophenon Anhydride, is a brownish-red, crystalline powder. A 2 per cent. solution, with as much soda, stains green any denuded spots on the cornea, and is therefore used as a means of diagnosing corneal ulcers and foreign bodies. It has been used as a test of death ; a bright green coloration of the visible mucous membranes follows the injection of 15 grs. dissolved in water containing an equal amount of sodium bicarbonate, if there be any circulation of blood in the body.

Sodium Fluoresceïn, or Uranin, is more soluble and convenient, and may be had in tabloids. It has been also found useful in detecting the early stages of sympathetic ophthalmia and corneal ulcers.

Rhigolene, or Amyl Hydride, is a light hydrocarbon, boiling about 30° C., obtained from petroleum spirit, and used to produce local anæsthesia by freezing the skin. Iodine dissolved in rhigolene, making a 1 per cent. solution, is used for chancres. Stabler found that the spray produced from a mixture of rhigolene and expressed oil was absolutely unirritating, and could be sprayed into the

throat. He finds that all essential oils and turpentine, salol, menthol, etc., can be sprayed in this way. The extreme inflammability and very unpleasant odour of rhigolene are the great drawbacks to its general use. It is also known under the names Hydramyl, Pentylene, and Pentyl Hydride, and enters into Amyl Colloid. The article supplied as Rhigolene is often impure, and only pure Amyl should be employed.

Rhus Aromatica, or Fragrant Sumach, is an astringent, given in cystitis, hæmorrhage, night-sweats, hæmaturia, menorrhagia, diarrhœa, and dysentery. Its pharmacology is not clearly understood; it has some selective action upon the urinary tract; the resin which resides in the root-bark is eliminated by the kidneys. (*R. Glabra* has similar action.)

Excellent results have followed its administration for the nocturnal incontinence of urine. Unna declares that it is a specific for this condition, acting upon the muscular fibre of the bladder. Under 2 years he gives 5 mins. of fluid extract night and morning, and between 2 and 10 years 10 mins.; and continues its use after the symptoms disappear.

Rhus Toxicodendron, Poison Oak, or Poison Ivy.—The fresh leaves of this plant cause great cutaneous irritation and inflammation even upon slight contact in some people. Internally, in large doses similar action appears to be excited in the stomach and intestines. It possesses properties like the preceding remedy, when given in minute doses—2 mins. of tincture (1 to 8) diluted, and it has been administered for incontinence of urine and atony of the bladder; it has been given in rheumatism and paralysis, but is worthless in these diseases. Externally, it has been used in rheumatism and eczema, and the juice has been applied as a caustic in cancer.

Plaff has separated the active principle of rhus in the form of an oil which he calls Toxicodendrin, and it has been suggested as a counter-irritant.

Ricin is the highly poisonous principle which exists in the bean of the castor-oil plant, but which is not found in the expressed oil. It is used as a test for pepsin. Ricinoleic acid is the active principle of castor oil which is set free by the alkaline secretion of the duodenum. Sulphoricinate of sodium is used as a suppository in chronic constipation, and its phenol combination in 25 per cent. solution has been employed as a local application in ozœna and tubercular laryngitis. Magnesium ricinoleate (Maricol) is introduced as a purgative substitute for castor oil.

Rosinol, Retinol, or Resinol, is an oily hydrocarbon, with a faint, peculiar odour, non-saponifiable, and unirritating, obtained by the dry distillation of resin. It is powerfully antiseptic, and can be applied upon lint to ulcers and putrid sores, and to cancer of the uterus, etc. It has also been given internally in bronchitis and gonorrhœa in 1 dr. doses in capsules.

With half its weight of lanoline it has been applied to the conjunctiva in catarrhal conditions, and used in eczema, impetigo, scabies, hæmorrhoids, pruritus, etc. It has been brushed over the false membrane in diphtheria. (Resinol is also the name given

to a proprietary ointment which possesses similar properties, and relieves pruritus. Rosenol is a synonym for otto of roses.)

Its greatest value, however, lies in the fact that it can be mixed with a great number of drugs already found useful in skin therapeutics, and it makes a stable, unirritating base for ointments. It dissolves phosphorus, Peruvian balsam, naphthol, camphor, salol, and many other agents.

Rubidium Salts.—The Bromide and the Ammonium Bromide have been introduced in the treatment of epilepsy and other spasmodic affections as substitutes for the sodium, potassium and ammonium bromides, over which, however, they do not seem to possess any superiority. They are white crystalline soluble salts, given in the same dosage. Rubidium Iodide is employed as a substitute for sodium and potassium iodide when large doses are required, as in tertiary syphilis.

Rumicin is the eclectic preparation obtained from the root of *Rumex crispus*, or Yellow Dock. It is vaunted as possessing astringent and aperient qualities like rhubarb, and alterative and tonic virtues in doses of 2 to 5 grs., in pill. It contains emodin and chrysophanic acid, and has been given internally in psoriasis, chronic laryngitis, scrofula, dyspepsia, and hepatic diseases, and as an alterative astringent in diarrhoea.

Safrol.—Oil of sassafras consists of about 90 per cent. of this substance, the remaining 10 per cent. being terpene, with a little eugenol. It is obtained in large quantities from Japanese camphor oil, and is used for perfuming soaps. Safrol has been given in doses of 20 to 30 drops in acute and subacute rheumatism and sciatica. Locally it acts like menthol, and is a splendid remedy for pediculi when brushed over the hair.

Salacetol, or Salicyl-Acetol, is the salicylic ester of acetone alcohol in shining, flat, insoluble crystals. It is claimed to be an excellent intestinal antiseptic, and has been given in various forms of diarrhoea and in rheumatism. Bourget's method of treating diarrhoea is to give 30 to 45 grs. in 1 oz. castor oil before breakfast. It is stated to be non-poisonous, as the drug splits into salicylic acid after passing into the duodenum. It must not be confounded with Aspirin, which is Acetyl-salicylic Acid or Acetysal, nor with Sal Acetosella, which is the poisonous oxalic acid compound consisting of a mixture of potassium tetroxalate and oxalate, used for removing ink-stains and iron-mould, and known as Salt of Sorrel.

Salbromalid, or Antinervin, is a colourless, crystalline powder, consisting of a mixture of salicylanilide and bromoacetanilide. The German preparation is obtained by mixing bromide of ammonium 1, salicylic acid 1, and antifebrin 2. It is also known under the name of Salicylbromanilid, and it is claimed for it that it possesses the virtues of bromides, salicylic acid, and antifebrin, in tabloids or wafers of 3 to 5 grs.

Salicylamide exists in small, tasteless, colourless crystals. It is the amide of salicylic acid obtained by acting upon the oil of winter-green by strong ammonia. It acts like a concentrated salicylic

acid, and is reputed to have a much stronger analgesic action. Its dose is only 5 grs., in tablets. It is used in acute rheumatism and in migraine.

Saligenin exists in colourless scales, obtained by treating phenol with formic aldehyde. It is introduced as a substitute for salicylic acid in the treatment of acute rheumatism and other affections, and it is stated to be free from the drawbacks of salicylic acid. It may be given in doses of 5 grs. every two hours in powder. It is also known as Salicylic Alcohol and as Orthooxybenzyl Alcohol.

Salix Nigra, or Black Willow, used by H. Fenwick as a sexual sedative, has been given in ovarian hyperæsthesia, seminal emissions, and urethral neuralgia. Paine and Hutchinson report most favourably upon its action as a sedative in uterine and ovarian pain, and in hemicrania, and excellent results have been obtained in facial neuralgia, hysteria, and nymphomania. The bark, root, and buds are made into a fluid extract 1 in 1, of which $\frac{1}{2}$ to 1 dr. may be taken three times a day.

Salumin is a reddish powder insoluble in water; it is a salicylate of aluminium, and is used for its astringent and antiseptic qualities as a powder insufflated in ozæna and other affections of the nasal membrane and pharynx.

There is a soluble salumin—a compound salt with ammonia—which is used as an astringent gargle and lotion. These compounds act like Tannal. (See under Aluminium Aceto-tartrate.)

Sanguinaria Canadensis, or Blood Root.—The rhizome has been found in full doses to act as a powerful emetic, causing purging, salivation, dilatation of the pupils, collapse, and death, preceded occasionally by convulsions, and a marked rise afterwards followed by a more marked fall in arterial tension and pulse. Reflex excitability, respiration, and muscular contractility are diminished. Sanguinarin, the resinoid extractive, is a stimulating expectorant in chronic bronchitis and asthma, and in small doses ($\frac{1}{2}$ to $\frac{1}{8}$ gr.) it acts without irritating the stomach. In still smaller doses ($\frac{1}{10}$ to $\frac{1}{20}$ gr.) it may be given for atonic dyspepsia, as it increases the secretions of the stomach and intestines. It has been tried in febrile conditions for its sedative action upon the vascular system, but, as it only acts in this way in full doses ($\frac{1}{2}$ to 1 gr. or more), which cause much irritation of the stomach, it is inferior to hellebore, aconite and other remedies. It acts as an hepatic stimulant, and increases the flow of bile.

It also acts as an emmenagogue, and has been given in functional uterine ailments, but it is dangerous, and should be discarded for this purpose. The dose of the U.S.P. tincture is 30 mins., or of the fluid extract 5 mins. Sanguinarine is the alkaloid, and its nitrate has similar action as an expectorant in doses of $\frac{1}{10}$ gr.

Sanoform, or Di-iodo-methyl-salicylic-ether, is a white, odourless powder, consisting of nearly two-thirds of its weight of iodine. It is stable and insoluble, and is introduced as a substitute for iodoform. It is stated to have wonderful desiccating properties, and is highly recommended in ophthalmic practice and as a remedy for ulcers.

It is non-poisonous, and can be completely sterilised by heat without the danger of being decomposed. This property, with its absence of odour, gives it great advantages over iodoform.

Sanose is the name given to a very digestible and palatable white powder, devoid of odour, which is a mixture of 8 parts of casein and 2 parts of albumose. It can be used like Nutrose as a food for typhoid and other patients, either mixed with milk or sprinkled over soup in the same way that the Italians use powdered Parmesan cheese.

Santalol is a mixture of the two alcohols which make up the bulk of the official oil of sandal-wood. It is known as Arhéol. It is much less liable to disturb digestion and upset the renal functions; given in capsules (5 mins.) in gonorrhœa, bronchitis, and cystitis. Its Methy-salicylate is given in the same doses and manner (see under Camphosan). Gonal and Gonoral are preparations of a purified form of sandal oil, consisting chiefly of santalol.

Santyl is a clear oily liquid, which is the salicylic ester of santalol; it is preferable to the oil of sandal and to its alcohols, owing to its freedom from all irritating qualities, so that it can be freely administered in acute gonorrhœa, possessing a specific antiseptic action in both anterior and posterior urethritis when given in 30 min. doses in coffee or milk, or in the form of capsules after food. It has also a most beneficial action in the troubles arising from prostatic disease, and has been successfully employed as a local application in ozœna.

Gonosan is a liquid preparation of Merck's, consisting of a 20 per cent. solution in oil of sandal of the α and β resins of *piper methysticum*, which, in 5 min. capsules, is used for gonorrhœa.

Blenosan is a similar preparation, used in the same form and dosage.

Santoninoxim is a substance in white, silky crystals, soluble in alcohol, which is prepared by heating 5 parts santonin, 4 parts hydrochlorate of hydroxylamine, and 4 parts carbonate of calcium with alcohol. Upon filtering the boiling liquid, and adding 5 times its bulk of boiling water and cooling, this substance crystallizes out. Cappola claims that it can be given in doses three times as great as santonin without the risk of producing any toxic symptoms, and it kills the worm, whilst santonin is said to only paralyse it.

Saw Palmetto is an American palm, whose active principles possess a remarkable selective action over the mucous membrane of the posterior urethral tract, bladder, and prostate, acting like santyl and santalol, with which it is frequently combined, as in the well-known proprietary medicine in use under the name of Sanmetto. The dose of the liquid extract of saw palmetto (1 in 1) is 1 to 2 drs. in cystitis, gonorrhœa, and enlarged prostate complications.

Scopola Carniolica has been used by Duckworth and others as a remedy for sweating and palpitation. It contains scopolamine, identical with hyoscine, and is less objectionable than belladonna. The fluid extract may be given in 2 min. doses. The root has been recommended instead of belladonna for all the preparations usually made with belladonna. (See under Hyoscine.)

Senecio Jacobæa, or common ragwort, is recommended by Murrel¹ and others as a drug of great value in functional amenorrhœa without anæmia. It is claimed for it that it always stimulates the menstrual function without having any tendency to produce abortion if pregnancy chances to exist in any case. The dose is 1 to 2 drs. four times daily of a 1 in 10 tincture of the entire plant, or up to 40 grs. daily of the solid extract may be given. It was once a popular remedy for jaundice. *S. aureus* and *S. gracilis* appear to have the same action. The drug should be given for one week in every month till the function is restored. When chlorosis is present, iron must be previously given. *S. aureus* is used in America as a hæmostatic in hæmorrhages from the kidney, lung, etc., in drachm doses of the liquid extract.

Silicon—Solution of Sodium Silicate—is a thick, syrupy liquid, known as Water or Soluble Glass, which has powerful antiseptic properties, and has been recommended in dyspeptic troubles. The corresponding potassium solution has been employed as a substitute for plaster of Paris to stiffen muslin bandages in fractures and surgical dressings. The mixed silico fluorides, under the name of Salufer, and the silico fluoride of sodium have been introduced as wound antiseptics.

Somatose is a yellow powder, odourless and tasteless, and soluble in water, consisting of the albumoses of meat with traces only of peptones. It is an easily absorbed food, and a perfect substitute for albumin in cancer or ulcer of the stomach and in all wasting diseases, and it is a powerful galactagogue. It may be given in milk or soup in amounts of 1 oz. daily, or in doses of 1 or 2 drs. for children. It is valuable in the vomiting of pregnancy. Milk Somatose with 5 per cent. tannin is vaunted as an ideal artificial food by Schmidt. Iron Somatose, which contains 4½ per cent. of ferric oxide in combination with albumose, is used in anæmia.

Somnal, or Ethyl-Chloral-Urethane, is a colourless liquid with a faint chloral-like odour, formed by the combination of alcohol, chloral, and urethane. It was introduced by Radlauer, and has been proved to possess hypnotic qualities in doses of 30 to 45 mins. in sherry or sweetened tincture. Its effects begin in 30 minutes, and it produces sound, refreshing sleep, lasting 6 or 8 hours. It is claimed for it that it does not interfere with the digestion, respiration, or circulation. It closely resembles chloral in its therapeutic action, but it yet remains to be demonstrated that it is free from the dangerous, depressing effects upon the heart. Somnos is an allied liquid compound derived from chloral, which is given in insomnia in doses of 1 to 4 drs. Chloral Urethane, or Ural, is a bitter crystalline salt, introduced as an hypnotic in 30 gr. doses, but it appears to be more depressing to the heart than chloral hydrate.

Soziodol, or Diiodoparaphenolsulphonic Acid, is the name given to an antiseptic in white crystals, devoid of odour, which contains 7 per cent. sulphur, 59 per cent. iodine, and 20 per cent. phenol. The substance used in medicine as soziodol is an acid sodium salt. There are also soziodols of potassium, of mercury, zinc, lead,

ammonium, aluminium, silver, and barium ; several of these have been recommended and used as substitutes for iodoform.

Lassar has used sozoiodol in skin diseases, in a 5 per cent. powder, paste,* or ointment, with zinc, starch, and vaseline or lanoline, and finds that it rapidly cures chronic eczema, tinea, impetigo, and ulcers. Other observers have utilised its powerful antiseptic qualities in the treatment of lupus, gonorrhœa, syphilis, ozæna, and tubercular laryngitis. It has been employed in every case where iodoform has been tried, and may be freely dusted on all ulcerated surfaces alone or with talc ; 2 per cent. solution is used for bladder irrigation and as a spray in pertussis. It has been administered internally in stomach affections and diabetes, in doses of 15 grs. thrice daily, and it is claimed for it that, unlike iodoform, it is perfectly safe and non-poisonous.

Sparteine is the active principle of broom ; it is a colourless, liquid alkaloid, which forms crystallisable salts, and it is the sulphate which is generally administered in medicine. It is a cardiac tonic acting like digitalis, and it possesses one advantage over this drug in the *rapidity* of its action ; 1 gr. hypodermically shows its power over the heart in less than 30 minutes. It may be given where digitalis disagrees, or in the intermissions of a long digitalis course, in doses of 1 to 2 grs. *ter die*. It is a fair diuretic, but not so reliable as digitalis either as a diuretic or cardiac tonic. In urgent cases of dilatation or failing compensation it may be injected with strychnine. Bradford states that though it raises the blood pressure and slows the heart, it weakens the force of the cardiac systole, and has not maintained its reputation as a cardiac tonic. The Hydrochloride of Oxysparteine—an oxidation product—is recommended for hypodermic injection. Scoparin, the other active principle of broom, has more decided diuretic action ; it may be given in cachets in doses of 10 grs.

Quite a number of observers testify to the value of small doses ($\frac{1}{16}$ to $\frac{1}{2}$ gr.) of sparteine hypodermically, 15 minutes before chloroform narcosis, in patients with weak or diseased hearts.

Spermine.—Poehl's preparation is a 2 per cent. sterilised solution of the chemical substance, which is the active principle of Brown-Séquard's emulsion, prepared from the seminal glands of various animals, chiefly from the bull. It is chemically allied to piperazine, and is given by deep injection in 15 min. doses. Poehl maintains that autointoxication arises in many conditions from the retention in the body of various decomposition products, as leucomaines, etc., and that these in health are oxidised by the ferment spermine which is produced by most glands as well as by the testicles. Hence the *rationale* of the injections in anæmia, neurasthenia, insanity, premature senile decay, phthisis, ataxy, psoriasis, diabetes, and a host of ailments. Glowing accounts of the benefits of a course of 12 or 14 daily injections in all the above diseased conditions have been published, and it has been reported as a valuable remedy for angina and other cardiac neuroses. The hydrochloride and phos-

* The substance known as Lassar's Paste does not contain sozoiodol. It consists of salicylic acid 2 parts, oxide of zinc 24 parts, powdered starch 24 parts, and vaseline 50 parts. It is very valuable in eczema.

phate of spermine have been also administered, but the soluble 2 per cent. solution of Poehl is the best for all purposes. It exercises a marked influence over the metabolic processes in the body. Dried testicular matter, or the extract prepared from the glands, has been administered in the tabloid form under the names of Orchidin, Testiculin, Orchitin, and Didymin, in 5 gr. doses, and a liquor is obtainable which is a glycerin extract, which is given in doses of 15 to 30 mins. by the mouth or hypodermically.

There is much diversity of opinion upon the active agent in orchitic extracts. Dixon points out the importance of the nucleo-proteid which is always present in large quantity, and of the extractives, other than spermine, which are present. The effect of the marked diminution in the polynuclear leucocytes which follows the injection is caused by the nucleo-proteid.

Stillingia Sylvatica, or Queen's Root, has been used in America as an alterative in syphilis and struma. It is a sialagogue, and when swallowed appears to increase the secretions of the gastric and intestinal glands by a mild irritant action; the liver is stimulated to secrete more bile, and if the dose be large, vomiting and purging supervene. The urine is increased, and the bronchial secretion is augmented. It has been given in ascites, caused by cirrhosis, in hæmorrhoids, chronic constipation, jaundice, and struma, in doses of the fluid extract (1 in 1) 20 mins. to 1 dr., or of Stillingin (its eclectic extract) 2 to 4 grs., or in drachm doses of the Compound Liquor, known as McDade's Succus Alterans.

Stovaine is a soluble, colourless, synthetic cocaine substitute, being the hydrochloride of Ethyl-dimethyl-aminopropinol benzoate. Its solutions are twice as powerful as those of cocaine; the drug has but slight toxicity, and is a vaso-dilator and cardiac tonic. It is the best of the local analgesics for producing spinal anæsthesia, and it has been extensively employed by Barker for this purpose; he uses an isotonic solution of 5 per cent., with the same percentage of glucose, and injects 1 c.c. (*without any adrenalin*) by lumbar puncture. The maximum dose by the mouth is given as 2 grs., but ten times this quantity with adrenalin has been injected in carrying out the local infiltration method of producing anæsthesia. 5 per cent. solution is suitable for eye, throat, and nasal work. For internal use in vomiting and gastritis, $\frac{1}{4}$ gr., with $\frac{1}{16}$ gr. morphia, and $\frac{1}{200}$ gr. atropine, may be given every 2 or 3 hours.

Strontium.—The lactate of strontium was praised as a remedy for albuminuria by D.-Beaumetz. It may be given in doses of 20 to 30 grs. three times a day. The writer has tried it extensively, but failed to find that it did any good.

The Bromide, Iodide, Glycerophosphate, Lactate, and Salicylate are introduced as substitutes for the corresponding potash and soda compounds, but there seems little to recommend them, except that they produce less gastric derangement; the doses are the same. Laborde praises the Phosphate as the most valuable restorative tonic. The Nitrate is given in 30 gr. doses in rheumatism; the Carbonate and Perborate are used as dentifrices. The Cinnamate in 5 gr. doses has action identical with hetol, and is used in tuberculosis.

Stypticin (Cotarnine Hydrochloride) exists in yellow soluble crystals, obtained by oxidising narcotine. It is allied chemically and therapeutically with hydrastinine. It controls remote hæmorrhages, and has proved satisfactory in menorrhagia when given by the mouth in $\frac{1}{2}$ gr. doses in capsules, or hypodermically in $\frac{1}{4}$ gr. 1 gr. dissolves in 10 mins. tincture of cinnamon, and half of this may be taken on sugar. It has also marked analgesic or soothing properties, and permanently reduces subinvolution, acting like ergot, though Marfori maintains that it has no vasoconstrictor action. Its best results are obtained in uterine hæmorrhages depending on ovarian changes. It is very valuable in uterine fibroids during the suspension of ergot, and may be employed in the hæmorrhage of uterine cancer internally and locally as a gauze.

Styptol is the Phthalate of cotarnine, a soluble salt less irritating in its action; it is given in doses of 1 gr. in pills or tablets, or injected hypodermically, or employed in 1 to 2 per cent. solution in dermatitis.

Succinum, or Amber, is the well-known fossil resin which yields a volatile oil—Oleum Succini—by destructive distillation. This is given in 5 min. doses in epilepsy, hysteria, and asthma, and is the basis of various liniments used for the relief of rheumatism. Succinic Acid is also obtained from amber by a destructive distillation process. It forms salts with iron, sodium, ammonium, and potassium, and these succinates have been used in various forms of colic—uterine, renal, and hepatic—in doses of 5 grs., and also as remote hæmostatics.

Succinic Peroxide, under the names of Alphozone and Alphogen, in the form of a white amorphous powder, has been introduced as a powerful germicide. 8 grs. added to 1 pint of water make a solution which, when freshly prepared, destroys with rapidity nearly all pathogenic organisms.

Sulphaminol, or Thio-oxydiphenylamine, is a harmless, yellow, tasteless, odourless powder, insoluble in water, possessing all the virtues of iodoform without its objectionable qualities. In contact with pus and the secretions from wounds and sores it splits up into sulphur and phenic acid. Moritz used it as a dry dressing to suppurating wounds, and found it to act powerfully in diminishing the discharge. It has also been used as an insufflation in laryngeal phthisis and nasal discharges, and it is reported that internally in doses of 4 grs. it has proved beneficial in cystitis and renal ailments.

Suprarenal Gland was first introduced as a remedy for Addison's disease. It powerfully increases blood pressure by causing contraction of the muscular walls of the vessels through its direct action upon unstriated fibre, and it maintains the tone of the muscles of the body and of the heart. The medulla is the active portion of the gland, but the cortex is not inert. After a full dose injected into an animal's vein, the heart is found to beat with greatly increased power, all the vessels contract, the pulsations get very slow, and the general blood pressure rises rapidly to a great height. A drop of a solution (1 in 25,000) of the active principle of the gland applied to a mucous membrane renders it in a few minutes perfectly blood-

less owing to the powerful contraction of its vessels, and a certain amount of local anæsthesia also results.

The activity of the gland is fortunately not readily destroyed by the gastric juice, and these effects follow its administration by the mouth, though the cardiac results are less satisfactory. Schäfer finds that it causes powerful contraction of the uterine muscle when swallowed, injected, or applied directly to the uterine walls.

The dried gland in 5 gr. doses is used, and a glycerin extract (1 in 1) may be given in 15 min. doses. For local use the tabloids may be rubbed up with hot sterilised water and the infusion applied on lint.

Adrenalin is a crystalline principle obtained from the gland, and it appears to possess all its properties. A solution of the Chloride in sterilised saline solution is used for injection in cardiac failure, pneumonia, shock, etc., or local application in epistaxis, hay fever, acute inflammations or hæmorrhages of the eye, nose, throat, larynx, or uterus, being the most efficient known hæmostatic for post-partum hæmorrhage. In remote hæmorrhages, as a rule, the effects are unsatisfactory, save in uterine bleeding, as the increased blood pressure must be reckoned with; but in hæmatemesis the administration by the mouth is often highly efficacious. The solution painted over the vulva often relieves obstinate pruritus, and has been employed in acne rosacea.

The adrenalin chloride solution is procurable (1 in 1,000), with 5 per cent. chloretone added; for the eye this is diluted with 10 parts of water, and for the nose and ear with 5 parts of water. This latter solution, when applied to the nasal membrane, will often cause an ordinary cold to abort. For internal use, 5 to 30 mins. of the (1 in 1,000) may be administered, and 10 mins., diluted with normal saline solution, may be given hypodermically.

Adrenalin is supplied under numerous trade names, as Adnephrein, Renostyptin, Hemisine, Renaglandin, Rachitol, etc. Merck's Paranephrin is a solution of the very pure active principle of the gland (0·1 per cent.), which corresponds in dosage and action to adrenalin solution 1 in 1,000. Various synthetically prepared substances have been recently introduced as substitutes for adrenalin. The most reliable of these are Methyl-amino-ortho-dioxy-acetophenone, Aminoketone, Ethyl-aminketone, Homeronon—a pyrocatechin derivative—and Arterenol, which is the hydrochloride of Dioxyphenol-ethanolamine.

Adrenalin has largely been employed as an adjuvans to the various cocaine and stovaine preparations used as local anæsthetics in operative surgery. Conephrin and Codrenine are solutions of adrenalin and cocaine used in dental extraction. Eusemine is the name given to a solution in normal saline of $\frac{3}{4}$ gr. cocaine hydrochloride and 5 mins. adrenalin chloride solution (1 in 1,000) in 100. Martindale prepares a liquid under the name of Adren-ol Solution, which contains 0·1 per cent. adrenalin in castor oil, for spraying purposes.

In Addison's disease the results have been very disappointing; generally the fatal issue does not seem to be retarded, but a few successful cases are reported. The writer tried it in several cases without the least benefit, and the same remark applies to his experi-

ence of it in diabetes insipidus. It is useless in epilepsy, rickets and a host of ailments for which it has been given. It has proved useful in failing compensation, and by plugging the nasal cavity with lint soaked in a 1 per cent. solution of the dried gland, the pallor and shrivelling of the tissues is so marked that the entire cavity can be easily seen and explored. Secondary hæmorrhage is not uncommon in cutting operations following its use. 5 to 10 grs. of the dried gland have given good results in the hæmorrhage of typhoid fever. It is liable to cause irritation of the stomach when given in hæmatemesis, but it acts well from the rectum.

Epinephrin is the name given to an alkaloidal substance isolated from the gland by Abel, which forms soluble salts capable of raising blood pressure to a surprising extent; it is said to be the active principle of the gland; it appears to be very closely allied to Adrenalin, but certainly differing from Suprarenin, which is a synthetically prepared substance.

Taka-Diastase is a yellowish-white powder, being a ferment produced by cultivating a fungus (*Eurotium Oryzæ*) on heated rice or bran. It is, according to Merck, known in Japan as Koji, and has been used in the production of alcohol from maize. It changes in a few minutes 100 times its weight of starch into maltose. 2 to 5 grs. may be given in wafer form in the dyspepsia caused by starchy foods in cases of hyperacidity of the stomach. It is in this latter condition that the best results of the drug are observed, and it may be prescribed like papain with sodium bicarbonate.

Tannalbin is a brown, tasteless, insoluble powder, being an albuminate of tannin, prepared at a high temperature so as to be insoluble in the stomach, and therefore it does not interfere in any way with digestion, whilst it is afterwards split up in the intestines, and acts as a local astringent there. It may be given with meals in doses up to 30 grs., and to infants in 5 gr. doses in all forms of diarrhœa, alone or with cod-liver oil.

The writer has abandoned all other intestinal astringents since he commenced to use this drug.

Honthin is a light brown, tasteless powder, being a keratinised compound of tannin with albumin, having the same dose and action as tannalbin.

Tannigen is a grey, insoluble, tasteless powder, being Diacetyl tannin. It is introduced as an intestinal astringent; being unacted upon by the stomach, it passes into the intestines, where it is split up and exerts its astringent action. Numerous observers testify to its value, and it may be given in wafer form, in doses of 15 to 20 grs.

Tannoform is a pinkish, odourless, tasteless, insoluble powder, being Methyl ditannin, produced by the action of formaldehyde on tannin. It is claimed for it that it is absolutely unirritating to mucous or other surfaces. Internally, it is given like tannalbin and tannigen in wafers, in doses of 15 grs., as an intestinal astringent in diarrhœa, enteritis, etc. When sprinkled on the skin it instantly stops sweating, and destroys the odour in bromidrosis. It is of great value as a local agent when applied to tender or so-

called scalded feet, and is used by troops on the march. It is recommended as a substitute for iodoform in the treatment of ulcers, wounds, eczema, burns, leucorrhœa, either sprinkled alone or with starch or talc, or used as a 10 per cent. ointment.

Tannol, Tannopine, or Tannone, is the name given to a brownish, tasteless, odourless, and insoluble powder produced by the action of tannin on hexamethylenetetramine or urotropine. It is given in diarrhœa and enteritis, and in all cases where tannin is indicated, in doses of 15 grs. three times a day. It has proved very valuable in tubercular ulceration and in typhoid diarrhœa, with or without hæmorrhage. This substance is not to be confounded with Tannal, which is mentioned under Aluminium Aceto-tartrate.

Tannyl is a yellow, odourless powder, being Oxychlor-casein tannate. It is used as an intestinal astringent, its tannic acid being set free in the duodenum. It is given in cachets, in 15 gr. doses, or in gruel, or any thick liquid in tubercular lesions of the bowel.

Tanocol is a greyish-white powder prepared like tannalbin ; it is a tannate of gelatin which is decomposed in the duodenum ; it is used in doses similar to the other tannates as an intestinal astringent.

Glutanol is a similar compound of tannin with vegetable fibrin, used in the same dosage.

Terpin Hydrate, or Terpine, occurs in colourless prismatic crystals, obtained by acting upon a mixture of turpentine and alcohol with nitric acid. It is found to be a good expectorant, and has been used by Fereira, Lepine, and many others in bronchitis and asthma. It increases and liquefies the expectoration in doses of 3 grs. in pills. In large doses it acts as a diuretic, and has been used with success in various bladder affections and in nephritis. It is stated that it reduces the number of the attacks in whooping-cough, and that it stops hæmoptysis. The Di-iodide of terpine is known as Pneumococcine, and is introduced as a germicide in acute pneumonia and tuberculosis, to be administered in 30 min. doses hypodermically.

Terpinol is an oily, aromatic, liquid, colourless body, prepared by treating terpine with dilute sulphuric acid. It is, like it, insoluble in water, and is used as an expectorant, given in capsules or pills, or per rectum, in doses of 2 to 5 mins. It has been recently extolled in hæmoptysis, in 3 min. doses in milk. It should not be confounded with Terpineol (Terpilenol, or Ciny Alcohol), which is a thick, colourless alcohol contained in terpinol, and now used to mask the odour of iodoform.

Tetronal, or Diethyl-methane-diethyl sulphone, is a body existing in tabular, odourless, shining, bitter crystals, which is closely allied to sulphonal and trional. It has been administered in a large number of cases as an hypnotic, and its indications are the same as those for sulphonal, but in some very obstinate nervous conditions it has given better results, though it often failed in conditions like delirium tremens. Tetronal is cumulative like sulphonal, but it has not succeeded in coming into the same general use. It is less reliable than trional ; best given in 10 to 20 gr. doses in wafers.

Teucrin is a sterilised fluid extract of *Teucrium scordium* (Water Germander), introduced by Mosetig-Moorhof. It is supplied in glass tubes, each containing one dose (3 c.c.m.), which is to be injected into the tissues around cold abscesses, lupus, etc., with the view of producing a local stimulating effect, and exciting healthy action in the diseased parts. *T. scordium* has long been used as a diuretic and as a remedy for piles and pruritus, in doses of 30 mins. of the fluid extract, or an equal amount of the compound electuary known as *Diascordium* (Codex), which also contains opium and numerous aromatic substances.

Thalline is Tetrahydroparamethyloxychinoline—a synthetically prepared basic substance, introduced by Skraup as an antipyretic and antiseptic. Owing to its power of destroying the red corpuscles it has ceased to be given internally. The Sulphate and Tartrate in 2 to 4 gr. doses cause marked fall in fever heat, with much sweating and sometimes collapse. In gonorrhœa they are useful in the form of a bougie or antrophore containing 1 to 2 grs., or as a 2 per cent. injection.

Thalline Periodide is a salt in dark crystalline masses which has been given in 3 gr. pills in cancer 6 or 8 times a day by Granville, who believed that the tumours disappeared under this treatment; a little musk was added, and, when the skin was dry, a little pilocarpine.

Theobromine is an alkaloid obtained from the seeds of *Theobroma cacao*, in white, crystalline powder, resembling caffeine in action. Theobromine is dimethyl-xanthine (Caffeine being trimethyl-xanthine). It is isomeric and identical with Theophylline found in tea, and with the synthetic alkaloid Theocine. It was maintained by G. Sée to be the best known diuretic, and preferable to diuretin, as it is harmless, and may be used in every kind of cardiac dropsy in doses of 8 grs. in powder four times a day. Huchard maintains that it is the best tonic for the senile heart.

The Salicylate of theobromine has the same action as the double salt—diuretin, but its insolubility renders it of little value. The Aceto-salicylate is closely allied; it is a white crystalline powder, administered in 5 gr. cachets. (See Diuretin, below.) The Sodio sodic acetate known as Agurin exists in yellow crystals very soluble in water. It is a fairly reliable diuretic, and has been also given with advantage in various forms of neuritis in 15 gr. doses.

The Sodium Citrate known as Urocitral has identical diuretic action. The Sodium sodium acetate of the synthetic alkaloid Theocine or of Theophylline is Sodium Di-methyl Xanthine with sodium acetate. It is known usually as Theophylline Sodium Acetate—a white powder, given in cardiac dropsy in doses of 5 grs.

Euphyllin is a white crystalline powder, being a combination of theophylline and ethylene-diamine. It is very soluble, and may be given by intra-muscular injection in uræmia in 5 to 10 gr. doses, or as a rectal injection or suppository.

Thephorin is a diuretin substitute, being the sodium sodium formate of theobromine—a white soluble powder, given in doses of 5 to 15 grs.

Iodo-theobromine is Theobromine sodium iodo-salicylate—a white powder, given as a diuretic in cardiac and renal and hepatic dropsy in 5 to 10 gr. doses. It corresponds to nearly 4 parts of salicylate of soda with about the same amount of theobromine, and half as much iodide of sodium. Eustenin is a similar double salt without salicylate; dose, 5 to 15 grs.

Diuretin is the sodio-salicylate of theobromine, containing half its weight of salicylate of theobromine. It possesses the great advantage over the single salicylate in its free solubility in water, and in 10 to 15 gr. doses thrice daily it has been given with success in cardiac dropsy; having no cerebral action, it does not cause insomnia, like the caffeine compounds. It is beneficial in cardiac asthma, and may be given in renal dropsy, where it acts as a stimulant to the renal epithelium.

Lithium-Diuretin, known as Uropherin, is a compound of theobromine-lithium with the salicylate of lithium. It is given in 10 to 15 gr. doses in chronic gout and renal diseases, and is of little use in cardiac dropsy. Uropherin B. is the benzoate of lithium and theobromine, possessing similar action, and also soluble in water, and given in the same dosage.

Thermodin (Acetyl - para - ethoxy - phenyl - urethane) exists in colourless insoluble crystals, introduced by Merck. Schmidt extols it as a safe and certain antipyretic in doses of 8 or 10 grs. in water. Few ill effects have been reported from its use. Mering recommends it in influenza and phthisis.

Thiol exists in dry scales, or as a strong solution of these. It is prepared from ordinary gas oil, and in its properties it closely resembles ichthyol, for which drug it has been recommended as a substitute in chronic scaly skin diseases, eczema, etc. It has been used (1 in 5 of glycerin) as an application to the ulcerated cervix uteri, and it has given good results in burns, erysipelas, etc., applied as an ointment of the same strength. It possesses the advantage over ichthyol in being odourless. It has been given internally in similar doses; thus 5 grs. of the *dry* thiol may be given three times a day in pill. 1 dr. of the *liquid* thiol to 1 oz. vaseline is the usual strength for ointments in eczema, etc. 1 part to 4 or 5 of talc may be used as a dusting powder.

Thiuret is a crystalline powder, introduced as an iodoform substitute. It is a derivative of sulphaminol, and the phenol-sulphonate is the salt generally employed. When applied as a dusting powder to moist surfaces nascent sulphur is given off.

Thorium.—The salts of this element have been found to possess a considerable degree of radio-activity. The Hydroxide is very active, giving off β rays, whilst Thorium X gives off both α and β rays for brief periods. The Sulphocarbolate and the Oleate have been employed in skin medication as remedies for eczema and psoriasis. The Cinnamate, Salicylate, Quinate, Urate, Glycero-phosphate, Lactate, and Ortho-coumarate are described by Martindale; but they await demonstration of their therapeutic usefulness. The Nitrate is employed for its incandescent properties in the manufacture of gas mantles. Kaestle has recently demonstrated that the Dioxide of thorium as found in calcined thorium earth.

when given in a dose of $\frac{3}{4}$ to 1 oz., may be used as a substitute for bismuth in Röntgen-ray work. The earth absorbs the rays, and the result is a good screen picture of the intestinal tube containing it.

Thuja Occidentalis, or Arbor Vitæ, is an old American remedy, used as a powerful emmenagogue like savin, and as a local remedy for warts and condylomata. Baratoux has used a tincture (1 in 5 of the green tops) internally in doses of $\frac{1}{2}$ to 1 dr., at the same time applying a spray of 1 in 20, to growths and tumours about the nose, mouth, ear, pharynx and larynx. He claims that this treatment rapidly destroyed all fetor and discharge, and ultimately reduced the vegetations and diminished the size of the new growths. Papillomata of the ear and nose were cured, and epitheliomas were considerably checked in their growth. Thuja is contained in the liquid known as Ecthol, which is given in 1 dr. doses in septic conditions.

Thymotal is the carbonate of thymol, which exists as a crystalline, colourless powder with little taste. It is recommended as a substitute for thymol, since it is said to pass unchanged through the stomach, and hence its value in doses of 10 to 15 grs. as a vermifuge in tænia and ankylostoma.

Thymaglycine is a liquid containing thymol and sodium benzoate in glycerin and water, given in teaspoonful doses, and used as a spray and mouth wash. Glycothymoline is a somewhat similar compound liquid, containing menthol and salicylates, used for the same purposes and as a local application to the vagina.

Thymolin is a mixture of 2 parts thymol, 2 parts camphor, with naphthaline to 40 parts.

Tolypyrin, or Toly-antipyrine, is an analgesic closely allied to antipyrine, for which it is introduced as a substitute, and from which it only differs in containing a third methyl group in the para position of the phenyl group (Helbing). It possesses no advantage over antipyrine, and is bitter in taste. In similar doses it has the same action and effects, but it has failed to come into general use.

Tolysal is the salicylate of the preceding substance, being Paratolyl-dimethyl-pyrazolone salicylate. In its action it resembles a combination of salicylic acid and antipyrine, and it is consequently recommended as an analgesic and antipyretic, chiefly in acute rheumatism and rheumatic neuralgia, in doses of 10 to 20 grs. four times a day.

Tonga is a preparation consisting of chopped stalks and small quantities of the leaves and inner bark of some plants imported from Fiji; believed to be derived from *Epipremnum mirabile*, and *Premna taitensis*. From these a liquid is prepared whose properties have been found to be decidedly antineuralgic. Ringer and Murrell investigated the drug, and found it to speedily cure 6 out of 8 cases of neuralgia in which they tried it. The dose of the liquid tonga, is 1 dr. three times a day.

Traumaticin is a thick fluid, being a solution of 1 part of gutta-percha in 9 of chloroform, and corresponding with the solution removed from the B.P. It is used as a basis for the application of chrysarobin, ichthyol, etc., in skin diseases. 1 part of chrysarobin to 9 of traumaticin was used by Auspitz for psoriasis.

Traumatol is Iodocresol—an insoluble, odourless, stable, and powerful antiseptic, containing 54 per cent. iodine. It is introduced as one of the thousand and one substitutes for iodoform. It is claimed for it that it is non-irritating, and has local anæsthetic properties. It can be used in every condition in which iodoform is indicated, as a powder or 10 per cent. ointment.

Trimethylamine, or Secalin, is a compound ammonia, obtained by distilling herring brine (or decomposing fish) with lime. It has been recommended internally in 3 gr. doses of the hydrochloride, and externally as a liniment in the treatment of acute rheumatism, but has passed into disuse.

Trional is Diethyl-sulphone-methyl-ethyl-methane—a substance existing in shining crystals, with a bitter taste, and slightly soluble in water. It may be regarded as sulphonal with a methyl displaced by an ethyl group. It acts like sulphonal, only more rapidly, is less cumulative, and is less frequently followed by drawbacks. It should be given in cachets in doses of 15 to 30 grs. It is, perhaps, the safest of all the newer hypnotics, and has been found most reliable in mania and simple insomnia where pain is not present. The only drawback noticed from its administration is the very rare one of hæmatoporphyria, and very occasionally neuritis has been observed to follow its prolonged use. It has also been successfully employed in pertussis.

Triticum Repens, or Couch Grass.—The rhizome of this common grass has been successfully used in chronic bladder ailments. It is a feeble diuretic, and appears to possess the virtues claimed for the stigmata of maize. It has fallen into disuse, because the dried grass appears to be almost inert. It is the *fresh rhizome* which should be always used. 2 ozs. boiled in 1 pint water for 15 minutes, of which a wineglassful should be taken every 4 or 6 hours. The drug is introduced into the Indian and Colonial Addendum to the B.P. under the name of Agropyrum with a decoction and liquid extract.

Ulexine is a colourless, or yellowish-white, crystalline alkaloid, obtained from the common gorse or furze or whin (*Ulex Europæus*). It is identical with Cytisine, obtained from *Cytisus laburnum*. It is found, in large doses, to be a powerful respiratory poison and paralyser of the motor nerves. It has a decided diuretic action, and has been given in cases of dropsy depending on heart disease, and it is maintained to be much more reliable than sparteine. It is not advisable to give more than $\frac{1}{12}$ gr. The hydrobromide, which is freely soluble in water, is the salt to be recommended. It has also been advocated as an antidote to strychnine.

Uranium.—The Nitrate has been re-introduced as a remedy for diabetes. It lessens thirst and diminishes the amount of sugar in the urine, and consequently lessens the bulk of the urine passed; at the same time the checking of the glycosuria allows the patient to gain weight and recover strength. The ordinary dose is about 3 grs. *ter die*. Large doses cause sugar and albumin to appear in the urine of healthy persons. The Uranium and Quinine Chloride salt is given in similar doses, and the Salicylate is less irritating than either of the above salts.

Urea, in a pure crystallised form, prepared synthetically from phenol carbonate, has been re-introduced as a diuretic under the name of Carbamide. It has been proven by the researches of Klemperer and Mering that it has the power of dissolving uric acid and enormously increasing the amount of urine. It has been strongly recommended as a preventive and as a cure for uric calculi, and as a means of draining the fluid in ascites from cirrhosis of the liver. The daily dose at first is 2 drs., increased to 4 drs., and later on to 5 drs. For the solution of calculi, half a teaspoonful four times daily of a mixture of urea, bicarbonate of soda, and carbonate of calcium is recommended. The Quinine salts are mentioned under Quinine.

Diethyl-malonyl-urea is known as Veronal, and with its homologue, Proponal, is described under Veronal. Bromural (*a*-brom-isovalerianyl-urea) is to be found under its own name.

Urethane (Ethyl-urethane or Ethyl-carbamate) is a substance in soluble, white, inodorous crystals, prepared by the action of nitrate of urea on ethyl alcohol. It is a mild hypnotic, not followed by any objectionable after consequences. Refreshing sleep may be induced by about 20 grs. given at bed-time, and repeated in two hours if necessary; but the writer has been invariably disappointed in every instance in which he has used it, though often the dose was 20 grs. It has, however, been given in doses of 45 to 60 grs., but it has ceased to be employed as an hypnotic except in the case of children. It is reported as having been used in tetanus with success, and in strychnine poisoning.

Hedonal is a white crystalline powder, introduced as a mild hypnotic in doses of 10 to 20 grs. in cachets. It is Methyl-propyl-carbinol-urethane, but its soporific powers seem very unsatisfactory. It is useless where there is pain. The drug should be given in cachets, up to 30 grs.

For Phenyl-urethane, see Euphorin; for Ethyl-chloral-urethane, see Somnal.

Urotropine is Hexamethylenetetramine, existing in colourless, soluble crystals, and was introduced as a solvent for uric acid like piperazine. Its synonyms and trade names are numerous, some of these covering substances which probably are not absolutely identical, as Aminoform, Formin, Cystamine, Cystogen, Uritone, Metramine, Naphthamine, Vesalvine, and Hexamethylenamine. It is prepared by the action of ammonia upon formic aldehyde. It is the most valuable and reliable of all the urinary antiseptics for disinfecting the bladder and pelvis of the kidney. It is excreted in the urine, where it is decomposed into formaldehyde, or some other antiseptic substance whose nature is still unknown, which disinfects the bladder and urethra. It is maintained that it will dissolve uric acid concretions when the urine is acid. It may be given in doses of 10 to 15 grs. in water, and is indicated in every form of cystitis, especially where the urine is foul. The best effects are found in those cases of bladder disease where the urine is acid on leaving the kidney. It speedily removes phosphaturia. Excellent results may be obtained from 8 grs. It is most efficacious for disinfecting the urine after typhoid fever, as the bacilli remain in the

urinary tract for months and spread the disease. It has been given with marked success in 20 gr. doses in the coma of diabetes.

Uresin is urotropine dilithiacitrate, whilst Urosin is the name given to lithia quinate, both of which are given in 5 gr. doses in gout.

Helmitol is known as New Urotropine ; it is the Anhydromethylene citrate of urotropine, existing as a white soluble crystalline powder, given in 15 to 20 gr. doses in cystitis, gonorrhœa, and prostatic complications. Hetralin is Dioxybenzol urotropine—a white crystalline powder introduced as a urotropine substitute, over which it, however, seems to possess no advantages. It is given in similar doses.

The Sodium-acetate compound of urotropine is known as Cystopurin, the Triborate as Borovertin, and the compound with Quinic acid as Quino- or Chino-tropine, all of which possess the same antiseptic properties as urotropine when given in 15 to 20 gr. doses.

Ustilago Maidis, or Corn Smut, or Corn Ergot, is the fungus which attacks maize, causing irregular swellings on the young ears, from the size of a pea to that of a foetal head. The blackish, dusty powder in the interior is the part employed. It appears to act like ergot, and it keeps better, and is less expensive. It is said to differ from ergot in not producing prolonged contraction of the uterus, but in increasing markedly the rhythmic contractions and relaxations, hence it is more valuable during labour than after (Hubbard). Upon the other hand, Kobert maintains that it is quite inert, and several others state that it has no ergot-like properties at all.

Dose—1 dr. of the liquid extract (1 in 1).

Vanillin, Vanillic Acid, or Methylprotocatechuic aldehyde, exists in acicular crystals, and is the odorous and flavouring principle of vanilla pods. It is prepared from coniferin artificially, and from eugenol and from nitro-benzol. It is antiseptic, and has been recommended in 1 gr. doses in various forms of dyspepsia. Its chief use, however, is as a flavouring agent. Paraphenetidin-vanillin-ethylcarbonate is known as Eupyrine ; it has antipyretic properties when given in 20 gr. doses in feverish conditions.

Veratrol, or Pyrocatechin-dimethyl-ether, is a colourless, liquid antiseptic, local anæsthetic, and analgesic, like guaiacol. It is painted on the skin over neuralgic nerves, or with the view of reducing body temperature, or in 2 min. capsules 4 times a day in phthisis and tubercular diseases. It is also produced in the crystalline form.

Veratrum Viride, or Green Hellebore.—The rhizome and rootlets are used extensively in America in the class of cases where aconite is indicated. Though the drug is powerfully toxic, the large doses in which it has been constantly given seldom cause death, as vomiting supervenes. It is a powerful cardiac depressant, and 15 min. doses of the B.P.C. tincture cause a considerable drop in the pulse-rate. It has been used with considerable success in pneumonia, most sthenic fevers and inflammations, acute rheumatism, and all conditions where high arterial tension is present, and numerous reports testify to its value in puerperal convulsions. 5 mins. of the tincture are given every hour till the pulse falls to 60.

Verbascum Thapsus (The Mullein Plant) is a popular Irish remedy in pulmonary complaints, and the original method of administration, which was that recommended by Quinlan, was to boil 4 ozs. of the fresh leaves, or a corresponding quantity of the dry, for 10 minutes in a pint of milk fresh from the cow, to be drunk whilst still warm. This dose should be taken when possible three times a day.

It appears to act as a nutrient like cod-liver oil, and it also possesses expectorant properties. The virtue of 3 pints daily of boiled milk* must very substantially augment the therapeutic action of the mullein plant; the milk masks its unpleasant taste; the juice may be given in porter.

Veronal is a white crystalline powder, being Diethyl-barbituric Acid or Diethyl-malonyl-urea. It is also known as Malourea, Malonal, and Hypnogen. The drug has proved to be a valuable hypnotic, very seldom giving rise to any toxic symptoms when administered in 10 gr. doses in cachets, followed by any hot liquid beverage, speedily producing calm and refreshing sleep in the insomnia of cardiac disease and sleeplessness from other causes. It may with advantage be given in hot water or weak hot punch. It has proved of great value as a preventive of sea-sickness and as a remedy in the vomiting of pregnancy, of chloroform sickness, and chronic cocaine poisoning, and it has been found useful in aiding chloroform and ether narcosis when administered two hours before the operation.

Propional (Dipropyl-barbituric acid) is an homologous substance, existing as a white, more sparingly soluble crystalline powder, given in insomnia in half the dose of veronal—i.e., 5 grs. It is also known as Homalourea.

Viburnum Opulus (The Snow-Ball Tree).—The dried leaves, bark, and berries have been found to relieve the pain of angina pectoris. A fluid extract of the bark (under the name of Cramp Bark) (1 in 1) is extensively used as an antispasmodic in colic, hysteria, etc., and has been used in America with considerable benefit in dysmenorrhœa, and as a uterine sedative in menorrhagia and threatened abortion, in doses of 1 to 2 drs.

V. prunifolium, or black haw, has the same action and dosage, (see Colonial Addendum) and there is a Compound Elixir in the B.P.C.

Vioform, or Iodochloroxyquinoline, is a yellow, insoluble powder—an iodoform substitute introduced by Tavel; it is reputed to be powerfully antiseptic and non-toxic, and is especially valuable in operations upon tubercular joints; the powder may be freely used in every condition in which iodoform has been employed, alone or made into an emulsion with glycerin and alcohol.

Viola Odorata.—The flowers, leaves, and entire plant of the sweet-scented violet, wild and cultivated, have found a place in several Continental pharmacopœias, having an ancient reputation in the treatment of cancer when taken internally and applied externally. The plant is supposed to contain an active glucoside, which, however, has never been satisfactorily isolated. The leaves of the Princess of Wales variety are said to give the best results in dose

of 4 drs. of a 1 in 1 liquor. The wild pansy (*Viola tricolor*) is believed to have similar properties of checking the discharge and relieving the pain of malignant growths.

Warburg's Tincture (Tinctura Pyrexialis).—A preparation which has gained for itself a very high reputation in the treatment of pyrexia; it is prepared from a formula containing about twenty drugs, including quinine, published in the B.P.C. It is of value in malaria and other fevers, and in malarial neuralgia. It is administered in a tablespoonful dose, after the bowels have been thoroughly emptied, no drink being permitted; it is repeated again in three hours, after which profuse aromatic perspiration and a marked fall of temperature set in, with rapid convalescence. It is very useful in several forms of collapse.

Yohimbine Hydrochloride is a new aphrodisiac obtained from the bark of *Corynanthe yohimbé*—the Cameroon-tree from West Africa. It produces a very decided hyperæmia of the male sexual organs in doses of 5 to 10 mins. of a 1 per cent. solution. The reports of many competent authorities who have given the drug in impotence of the neurasthenic type testify to its action, which is said to be quite free from all drawbacks. It is stated to have no effect upon normal individuals. It may be given in 10 min. doses of 1 per cent. aqueous solution hypodermically or by the mouth, or in the form of a minute pill or tabloid, $\frac{1}{10}$ gr. It has been pointed out that even in small doses the drug has the power of lowering the temperature to a remarkable extent, and a 1 per cent. solution causes complete anæsthesia of the cornea. A liquid preparation, under the name of Aphrodine, has been introduced into veterinary practice.

Zea Mays (or Corn Silk).—The stigmata or green pistils of *Zea Mays* have been much praised in America as possessing specific or alterative action upon the bladder and genito-urinary tract. It appears to be most active when prepared fresh, and good results have followed its use in cystitis, renal calculi, and pyelitis. It is a diuretic of the mildest and least irritating type. In the nocturnal incontinence of urine it has been tried with benefit, and it has been given with success in the later stages of gonorrhœa.

It has been stated to have a digitalis-like action upon both heart and kidney. 1 to 4 drs. of the liquid extract (1 in 1) may be given three times a day, or 20 grs. of the extract given three or four times daily.

Zinc Salts.—In addition to those in the B.P. there are several salts of zinc in constant use, as :—

The Bromide, which is a soluble granular powder used in solution in 5 to 8 gr. doses in epilepsy.

The Borate—A white amorphous insoluble powder used by Kollo as a substitute for iodoform, and as an ointment in eczema.

The Citrate, in doses of about 10 grs., and the Lactate, in doses of 2 grs., have been administered in epilepsy.

The Iodide is an unstable deliquescent salt given in 1 gr. doses in scrofula, tertiary syphilis, and epilepsy.

The Iodate is chiefly employed as a dusting powder or ointment.

The Phosphide possesses the properties of free phosphorus, and is given in the pill form in doses of $\frac{1}{20}$ to $\frac{1}{5}$ gr.

The Cyanide is recommended in heart disease, and cardiac tonic and sedative properties are assigned to it in doses of $\frac{1}{4}$ gr. It is a powerful antiseptic.

The Zinc and Potassium Cyanide is given in similar doses, and the Zinc and Mercuric Cyanide is chiefly used as a gauze dressing for wounds.

The Nitrate is a more powerful, but less painful, caustic than the official chloride.

The Salicylate, though soluble (1 in 25 of water) is used as a dusting powder, but its best effects are obtained by combining it with gelatin in a paste. It is given as a nervine tonic in 5 gr. doses, like the valerianate.

The Sulphanilate known as Nizin is injected (1 gr. in 8 ozs. water) in gonorrhœa.

The Sulphhydrate, an unstable white precipitate, is used as a 1 in 10 ointment in eczema, tinea, etc., and given internally in 1 gr. doses.

The Permanganate is employed as a substitute for the potassium salt in gonorrhœa (1 gr. in 8 ozs.).

The Sozoiodol, Phosphate, Chrysophanate, Gynocardate, Stearate, Ichthyolate, and Oleate are indicated in the conditions in which their acids are employed.

The Subgallate is a greenish powder used as a dusting powder or ointment, and it is also given internally in 2 gr. doses as an astringent and antiseptic in diarrhœa.

The Sulphite is a powerful antiseptic, used chiefly like the mercurio-zinc cyanide in the form of a gauze dressing.

INDIAN AND COLONIAL ADDENDUM

TO THE B.P.

Government of India Edition, 1901.

The Divisions of the Empire within which each Drug and Preparation now acquires official sanction are indicated after each.

Acacia Cortex—The dried bark of *A. arabica* and *A. decurrens*. (Black Wattle.) *Astringent*. Decoction (1 in 16). Dose— $\frac{1}{2}$ to 2 ozs.

INDIA, AUSTRALASIAN, AND EASTERN COLONIES.

Acalypha—The fresh and dried herb of *A. indica*. *Expectorant* and *Laxative*—Ext. Liq. (1 in 1). Dose—5 to 30 mins. Succus—1 to 4 drs.

INDIA, EASTERN COLONIES.

Adhatoda—The fresh and dried leaves of *A. Vasica*. *Expectorant*. Ext. Liq. (1 in 1). Dose—20 to 60 mins. Succus—1 to 4 drs. Tincture (1 in 8). $\frac{1}{2}$ to 1 dr.

INDIA, EASTERN COLONIES.

Agropyrum—The dried rhizome of *A. or Triticum repens*. (Couch Grass.) *Diuretic*. Decoction (1 in 20). Dose— $\frac{1}{2}$ to 2 ozs. Liq. Ext. (1 in 1). 1 to 2 drs. See p. 612.

AUSTRALASIAN, EASTERN, AND NORTH AMERICAN COLONIES.

Alstonia—The dried bark of *A. scholaris* (Dita bark) and *A. constricta*. *Astringent in Dysentery*. Infusion (1 in 20). Dose— $\frac{1}{2}$ to 1 oz. Tincture (1 in 8). $\frac{1}{2}$ to 1 dr.

INDIA, AUSTRALASIAN, AND EASTERN COLONIES.

Andrographis—The dried plant of *A. paniculata*. *Bitter Tonic*. Infusion (1 in 20). Dose— $\frac{1}{2}$ to 1 oz. Liq. Conc. (1 in 2). $\frac{1}{2}$ to 1 dr. Tincture (1 in 10). $\frac{1}{2}$ to 1 dr.

INDIA AND EASTERN COLONIES.

Aristolochia—The dried stem and root of *A. indica*. *Alterative* and *Diaphoretic*. Liq. Conc. (1 in 2). Dose— $\frac{1}{2}$ to 2 drs. Tincture (1 in 5). $\frac{1}{2}$ to 1 dr.

INDIA AND EASTERN COLONIES.

Arnice Flores—The dried flower-heads of *A. montana*. *Resolvent*. Tincture (1 in 10). Dose— $\frac{1}{2}$ to 1 dr.

NORTH AMERICAN COLONIES.

Aurantii Cortex Indicus—The fresh and dried outer part of the pericarp of varieties of *Citrus Aurantium* grown in India and Ceylon. *Bitter Tonic*. May be used in making the B.P. preparations containing the Bitter Orange Peel in

INDIA AND EASTERN COLONIES.

Azadirachta Indica—The dried bark of the stem of *Melia Az.* (Neem or Margosa Bark). *An Astringent Bitter*. Infusion (88 grs. to 1 pint). Dose— $\frac{1}{2}$ to 1 oz. Tincture (1 in 10) $\frac{1}{2}$ to 1 dr.

INDIA AND EASTERN COLONIES.

Beleæ Fructus—The fresh half-ripe fruit of *Ægle Marmelos* (Bael). *Astringent*. Ext. Liq. (1 in 1). Dose—1 to 2 drs.

INDIA AND EASTERN COLONIES.

Berberis—The dried stem of *B. aristata*. *Antiperiodic*. Liq. Conc. (1 in 2). Dose— $\frac{1}{2}$ to 1 dr. Tincture (1 in 10). $\frac{1}{2}$ to 1 dr.

INDIA AND EASTERN COLONIES.

Betel—The leaves of *Piper Betle*. *Sialagogue*.

INDIA AND EASTERN COLONIES.

Buteæ Gummi—The inspissated juice from the stem of *B. frondosa* (Bengal Kino) and *Buteæ Semina*—the seeds of the same. *Astringent*. The seeds are *anthelmintic* and *laxative*. Powder. Dose—10 to 20 grs.

INDIA AND EASTERN COLONIES.

Calotropis—The dried root-bark of *C. procera* and of *C. gigantea*. (Mudar.) Dose—3 to 10 grs. as a *Tonic*, and 30 to 60 as an *Emetic*. Tincture (1 in 10). $\frac{1}{2}$ to 1 dr.

INDIA AND EASTERN COLONIES.

Cambogia Indica—The gum-resin from *Garcinia Morella*. *Drastic Purgative*. Dose— $\frac{1}{2}$ to 2 grs.

INDIA AND EASTERN COLONIES.

Catechu Nigrum—An extract from the wood of *Acacia Catechu*. *Astringent*. Dose—5 to 15 grs.

INDIA, EASTERN, AND NORTH AMERICAN COLONIES.

Cissampelos—The dried root of *C. Pareira*. (False Pareira Brava.) *Diuretic*. Decoction (1 in 8). Dose— $\frac{1}{2}$ to 2 ozs. Ext. Liq. $\frac{1}{2}$ to 2 drs.

INDIA AND EASTERN COLONIES.

Coscinium—The dried stem of *C. fenestratum*. *Bitter Tonic* like calumba. Infusion (1 in 20). Dose— $\frac{1}{2}$ to 1 oz. Liq. Conc. (1 in 2). $\frac{1}{2}$ to 1 dr. Tincture (1 in 10). $\frac{1}{2}$ to 1 dr.

INDIA AND EASTERN COLONIES.

Cucurbitæ Semina Præparata—The prepared fresh, ripe seeds of cultivated plants of *C. maxima*. (Melon Pumpkin Seeds.) *Anthelmintic*. Dose—3 to 4 ozs., rubbed with a little water or milk.

MEDITERRANEAN COLONIES.

Daturæ Folia—The dried leaves of *D. fastuosa* var. *alba* and of *D. Metel*, and **Daturæ Semina**—the dried seeds of *D. fastuosa* var. *alba*. Tincture (1 in 4). Dose—5 to 15 mins. *Narcotic* and *Antispasmodic* like stramonium. The former in

INDIA, EASTERN, AND WEST INDIAN COLONIES,
and the Seeds in

INDIA AND EASTERN COLONIES.

Embelia—The fruit of *E. Ribes* and of *E. robusta*. *Anthelmintic*. Dose—1 to 4 drs.

INDIA AND EASTERN COLONIES.

Extractum Glycyrrhizæ Spirituosum—Extract of Liquorice (1 in 2) dissolved in spirit and water. *Demulcent*. Dose— $\frac{1}{2}$ to 1 dr.

INDIA AND EASTERN COLONIES.

Gossypii Radicis Cortex—The dried root-bark of *G. herbaceum*. (Cotton Root Bark.) *Emmenagogue*. Decoction (1 in 5). Dose— $\frac{1}{2}$ to 2 ozs. Ext. Liq. (1 in 1). $\frac{1}{2}$ to 1 dr. See p. 557.

INDIA, EASTERN, NORTH AMERICAN, AND WEST INDIAN
COLONIES.

Grindelia—The dried leaves and flowering tops of *G. squarrosa* and of *G. robusta*. *Antispasmodic*. See p. 557. Ext. Liq. (1 in 1). Dose—10 to 20 mins.

AUSTRALASIAN AND NORTH AMERICAN COLONIES.

Gummi Indicum—A gummy exudation from the wood of *Anogeissus latifolia*. *Demulcent* like gum acacia. Mucilage (2 and 6).

INDIA AND EASTERN COLONIES.

Hirudo Australis—*Hirudo quinquestrata*, the five-striped or Australian Leech.

AUSTRALASIAN COLONIES.

Hygrophila—The dried herb and root of *H. spinosa*. *Diuretic*. Decoction (1 in 10). Dose— $\frac{1}{2}$ to 2 ozs.

INDIA AND EASTERN COLONIES.

Ispaghula—The dried seeds of *Plantago ovata*. (Spogel seeds.) *Demulcent*. Decoction (120 grs. to 1 pint.) Dose— $\frac{1}{2}$ to 2 ozs.

INDIA AND EASTERN COLONIES.

Jalapæ Tinctura Composita—A tincture of jalap (1 in 13), containing also scammony and turpeth. *Purgative*. Dose— $\frac{1}{2}$ to 1 dr.

INDIA, EASTERN AND NORTH AMERICAN COLONIES.

Kaladana or **Pharbitis Nil**—The dried seeds of *Ipomœa hederacea*. *Purgative* like jalap. Dose—30 to 50 grs. Compound Powder (1 in 3). 20 to 60 grs. Tincture (1 in 5). $\frac{1}{2}$ to 1 dr.

INDIA AND EASTERN COLONIES.

Kaladanæ Resina or **Pharbitisin**—The resin from *Ipomœa hederacea*. *Purgative* like jalap resin. Dose—2 to 8 grs.

INDIA AND EASTERN COLONIES.

Kavæ Rhizoma—The dried decorticated rhizome of *Piper methysticum* without the roots. *Spinal Depressant*. See p. 572. Ext. Liq. (1 in 1). Dose—30 to 60 mins.

AUSTRALASIAN COLONIES.

Kino Eucalypti—An exudation from the stem of various species of *Eucalyptus* (Botany Bay Kino), identical with B.P. Kino. *Astringent*. Dose—5 to 20 grs.

AUSTRALASIAN COLONIES.

Mylabris—The dried beetle *M. phalerata* or other species of *M. Vesicant* like cantharides. Plaster (1 in 3 nearly). Warming Plaster (1 in 24). Blistering Liquid (1 in 2). Ointment (1 in 10). Vinegar (1 in 10). Corresponding to the B.P. Cantharides preparations.

INDIA, AFRICAN, AND EASTERN COLONIES.

Myrobalanum—The dried immature fruits of *Terminalia Chebula*. (Chebulic myrobalans.) *Astringent* like galls. Dose— $\frac{1}{2}$ to 1 dr. Ointment (1 in 5). Ointment with opium (7.5 per cent. opium).

INDIA AND EASTERN COLONIES.

Oleum Ajowan—The oil distilled from the fruit of *Carum copticum*. (Ajowan or *Ptychotis* Oil.) *Carminative*. Dose— $\frac{1}{2}$ to 3 mins., contains one-third its weight of Thymol.

INDIA AND EASTERN COLONIES.

Oleum Arachis—The oil expressed from the seeds of *A. hypogæa* (Earth-nut, Ground-nut, or Pea-nut Oil) resembling olive oil, for which it may be substituted in India, African Colonies, Eastern Colonies, and Australian Colonies in making the B.P. Liniments, Ointments, Plasters, and Soaps.

Oleum Gaultheriæ—The oil distilled from the leaves of *G. procumbens* or from the bark of *Betula lenta*; contains upwards of 90 per cent. methyl salicylate. *Antirheumatic*. Dose—3 to 10 mins., and *Local Sedative*. (See p. 552.)

NORTH AMERICAN COLONIES.

Oleum Graminis Citrati—The oil distilled from *Andropogon Citratus*. (Oil of Lemon Grass or Indian Oil of Verbena.) *Carminative*. Dose— $\frac{1}{2}$ to 3 mins., and *Local Anodyne*.

INDIA, EASTERN, AND WEST INDIAN COLONIES.

Oleum Gynocardiæ—The fatty oil expressed from the seeds of *G. odorata*, or of *Taraktogenos Kurzii*. (Chaulmoogra Oil.) Dose—10 mins., increased to 1 dr. Used in Leprosy. Ointment (1 in 10). See p. 532.

INDIA AND EASTERN COLONIES.

Oleum Sesami—The oil expressed from the seeds of *Sesamum indicum*. Resembles olive oil, for which it may be substituted for the B.P. Liniments, Plasters, Ointments, and Soaps in

INDIA, THE AFRICAN, EASTERN, AND NORTH AMERICAN COLONIES.

Oliveri Cortex—The dried bark of *Cinnamomum Oliveri*. (Black Sassafras.) *Carminative* like Cinnamon. Tincture (1 in 10). Dose— $\frac{1}{2}$ to 1 dr.

AUSTRALASIAN COLONIES.

Picrorrhiza—The dried rhizome of *P. Kurroa*. *Tonic*. Dose—10 to 20 grs. *Antiperiodic*. 40 to 50 grs. Tincture (1 in 8). $\frac{1}{2}$ to 1 dr. Ext. Liq. (1 in 1). 20 to 60 mins.

INDIA AND EASTERN COLONIES.

Podophylli Indici Resina—The powdered resin from the following drug:—*Purgative* and *Cholagogue*. Dose— $\frac{1}{4}$ to 1 gr. Tincture (2 grs. to 1 dr.). 5 to 15 mins.

INDIA AND EASTERN COLONIES.

Podophylli Indici Rhizoma—The dried rhizome and roots of *P. Emodi*; resembles the B.P. drug in action.

INDIA AND EASTERN COLONIES.

Sappan—The heart-wood of *Cæsalpinia Sappan*. It is an *Astringent* like logwood, and is also used as a dye. Decoction (1 in 20). Dose— $\frac{1}{2}$ to 2 ozs.

INDIA AND EASTERN COLONIES.

Tinospora—The dried stem of *T. cordifolia* collected in the hot season. *Tonic* and *Alterative*. Infusion (1 in 10). Dose— $\frac{1}{2}$ to 1 oz. Liq. Conc. (1 in 2). $\frac{1}{2}$ to 1 dr. Tincture (1 in 5). $\frac{1}{2}$ to 1 dr.

INDIA AND EASTERN COLONIES.

Toddalia—The dried root-bark of *T. aculeata*. *Bitter Tonic* like calumba. Infusion (1 in 10). Dose—1 to 2 ozs. Liq. Conc. (1 in 2). $\frac{1}{2}$ to 1 dr.

INDIA AND EASTERN COLONIES.

Turpethum—The dried root and stem of *Ipomœa Turpethum*. *Purgative* like jalap. Dose—5 to 20 grs. Enters into *Tr. Jalapæ Co.*

INDIA, EASTERN AND NORTH AMERICAN COLONIES.

Tylophoræ Folia—The dried leaves of *T. asthmatica*. *Expectorant*. Dose— $\frac{1}{4}$ to 2 grs. *Emetic*. 15 to 30 grs.

INDIA AND EASTERN COLONIES.

Urginea—The younger bulbs of *U. indica* and of *Scilla indica*. (*Indian Squill*.) *Expectorant* like squill. Vinegar (1 in 8). Dose—10 to 30 mins. Oxymel (1 in 15). $\frac{1}{2}$ to 1 dr. Compound Pill (1 in 4). 4 to 8 grs. Pill with *Ipecac.* (5 per cent. opium). 4 to 8 grs. Tincture (1 in 5). 5 to 15 mins. Syrupus (1 in 17). $\frac{1}{2}$ to 1 dr.

INDIA AND EASTERN COLONIES.

Valerianæ Indicæ Rhizoma—The dried rootlets and rhizome of *V. Wallichii*. *Antispasmodic*. Ammoniated Tincture (1 in 5). Dose— $\frac{1}{2}$ to 1 dr.

INDIA AND EASTERN COLONIES.

Viburnum—The dried bark of *V. prunifolium*. (*Black Haw*.) *Uterine Sedative*. Ext. Liq. (1 in 1). Dose—1 to 2 drs. See p. 615.

INDIA, EASTERN, AND NORTH AMERICAN COLONIES.

In the Appendix to the Addendum it is permitted that the waters of Anise, Dill, Caraway, Cinnamon, Fennel, Pimento, Peppermint,

and Spearmint may be made by triturating the oils with twice their weight of calcium phosphate and adding 500 times their weight of distilled water and filtering.

Hard Soap, Suet, Resin, or Beeswax may be used in the making of Plasters to counteract the softening caused by high temperatures, but the strength of active substance must always remain as in the B.P.

Alcohol may be added to the Liquid Extracts to prevent fermentation in India and the Tropics.

Dried Lemon Peel may be used where the fresh cannot be obtained.

Hard Soap in India may be made with Sesame or Arachis Oil.

Benzoated Suet and Prepared Suet in India may be substituted for Benzoated Lard and Prepared Lard in the B.P. ointments, and the Suppositories may have some White Beeswax introduced instead of a portion of the Ol. Theobroma, and some of the ointments may be treated in the same way.

In hot climates a portion of the oil in Adeps may be removed by pressure, constituting Adeps Induratus, which may be used to harden ointments.

Syr. Rheados may have its quantity of alcohol doubled to prevent fermentation.

INDEX

OF

POISONS AND THEIR ANTIDOTES.

(From the Author's "Dictionary of Treatment.")

POISONING.—In the treatment of poisoning, the first consideration in the great majority of cases will be to evacuate the contents of the stomach when this is possible. This may be accomplished by emetics or by the stomach-pump, or by tickling the fauces when these agents are not at hand. In poisoning by the strong mineral acids and all escharotic substances the stomach-pump is contra-indicated, but in the case of corrosive substances like carbolic acid this may be used cautiously if a soft tube be employed. Indeed, the soft india-rubber tube of the stomach-pump can scarcely do any harm except in the most destructive instances of poisoning by concentrated sulphuric or nitric acid, and the pump should always be fitted with such a tube in at least two sizes. When at hand the pump should be preferred to every other means of emptying the stomach, and except in the limited number of cases just mentioned, it may even be used when there is room for considerable doubt in the diagnosis of poisoning in patients found in insensible or comatose conditions. The coroner's court will justly censure the practitioner who has been in attendance upon a patient picked up in an insensible condition if the evidence afterwards produced proves that a narcotic poison had been swallowed, though when seen by the physician no such evidence had been forthcoming and the symptoms pointed to head injury, uræmia, or apoplexy. The cautious use of the pump with the rubber tube, when scientifically carried out, can in no way injure the patient's chances of recovery should the case ultimately turn out not to be one of poisoning; and as every minute's delay may be serious for the patient, and as there is thus short time for counsel and debate, he should be prepared to act accordingly and make his error upon the safe side.

The first time of using the stomach-pump is sure to be a bungling affair if the operator feels timorous or nervous. The tongue being depressed by the left index finger as the patient is seated in a chair, with the head well steadied by an assistant, and the gag in position, the tube is to be pushed steadily, boldly, and rapidly through the mouth, pharynx, and œsophagus till the stomach is reached. Though it is more difficult to pass the soft rubber tube, the confidence in its perfect harmlessness will be of great importance to the novice. He should not be deterred by the sound which may be produced by air passing through the tube as its extremity glides past the epiglottis; this ceases as the rubber is passed home into the stomach.

During the pumping, by reversing the action of the levers, a little water may from time to time be sent into the stomach to clear the tube of any solid obstruction, and before withdrawing it finally, tepid water should be injected into the organ, and this should be pumped out again, the operation being continued till the washings return clear. The antidote may be mixed with the water, and in many instances a quantity of this should be left in the stomach.

The Syphon Tube may take the place of the stomach-pump in most cases.

30 grs. of Sulphate of Zinc or 10 grs. of Sulphate of Copper in a tumblerful of tepid water will prove efficient emetics; and Apomorphine, $\frac{1}{10}$ gr. injected hypodermically, acts with great certainty and rapidity when the patient is unable to swallow.

Mustard in dessertspoonful doses, in copious quantities of tepid water, may be used when the above emetics are not at hand. Ipecacuanha and Antimony are too slow in their action to be depended upon.

The contents of the stomach when ejected (or when obtained afterwards upon opening the body) should be carefully preserved for further investigation. This is often overlooked in the exciting period of treatment.

The writer has several times successfully pumped and washed out the stomachs of infants and very young children with a soft India-rubber male catheter, attached to the nozzle of an ordinary large glass or metal syringe.

The following formula may be employed as a *general Antidote for any poison of unknown nature* :—

Calcined Magnesia, Powdered Wood Charcoal, Hydrrous Peroxide of Iron, equal parts of each.

Half an ounce of each of these may be given in a tumblerful of water every half-hour till three doses be taken.

☞ Judah Jona has recently demonstrated that a full dose of Adrenalin Chloride ($\frac{1}{2}$ oz., 1 in 1,000 solution, diluted), if given *immediately* after a lethal dose of strychnine, will cause such blanching of the gastric mucous membrane as to prevent for a time the absorption of the poison. This will give valuable time for the use of antidotal remedies. His experiments prove that this expedient is of vital importance in poisoning by the cyanides, and it may be advantageously resorted to after the accidental swallowing of all rapidly acting alkaloidal substances.

Acetanilid or Antifebrin.—The stomach-pump or an emetic of Carbonate of Ammonia should be used, followed by Strychnine, $\frac{1}{15}$ gr. hypodermically, and external warmth. Where cyanosis is marked, inhalations of Oxygen may be given, and free stimulation with Alcohol.

Acids, Mineral.—The stomach-pump should *not* be used. Alkalies—Lime, Soap, Chalk, Potash, Soda, or Magnesia—moderately diluted with water, may be freely given. In the absence of these, plaster off a wall (softened by hot water), oils (Almond or Olive), and small doses of Morphine hypodermically should be administered; all food

should be given by the rectum. At a later stage, when the danger of perforation has passed off, bland mucilaginous foods, like barley-water, linseed tea, and white of eggs, may be freely given.

Acid, Prussic (or Hydrocyanic).—The stomach, if possible, should be emptied by the stomach-pump or by a rapid emetic ($\frac{1}{2}$ dr. Sulphate of Zinc); hypodermic injections of Atropine ($\frac{1}{60}$ gr.)—2 mins. of the 1 in 100 Solution of Atropine may be given, and repeated in 30 minutes if necessary. Ammonia, or Whisky, inhalation of Oxygen, Ammonia, or Chlorine, cold and hot affusions alternately, and *artificial respiration*, are the best agents to resort to.

Freshly precipitated Oxide of Iron, followed by a solution of Carbonate of Potassium, is to some extent a chemical antidote, but *free stimulation* after the evacuation of the stomach must be alone relied upon.

Kobert's method consists in hypodermic injections at various points of 3 per cent. Peroxide of Hydrogen every 3 to 5 minutes, and washing out the stomach with 15 per cent. solution of the same drug. The rationale of the treatment consists in the change of the prussic acid into oxamide in the blood and stomach.

Aconite (and Hellebore or Veratrine).—The stomach-pump or emetics should be used; $\frac{1}{10}$ gr. Apomorphine hypodermically, or a tablespoonful of mustard in warm water, or $\frac{1}{2}$ to 1 dr. Sulphate of Zinc should be given as soon as possible. Stimulants—Whisky, and Ammonia hypodermically, with 20 to 30 mins. of *Tincture of Digitalis* or 2 mins. *Liquor Atropinæ* should be then administered. Strychnine may be given ($\frac{1}{20}$ gr.) by mouth, rectum, or hypodermically.

The patient should be kept horizontally on his back with his head lowered, and in a state of absolute rest, and sinapisms applied to the heart and extremities; and dry heat, friction, and artificial respiration kept up unceasingly. Murrell recommends inhalations of Nitrite of Amyl.

Alcohol.—The stomach-pump should be promptly used, and after evacuation of its contents the stomach should be filled through it with strong coffee, to which a little Ammonia should be added; or a hypodermic injection of 10 mins. Apomorphine Solution may be given in the absence of the pump; sinapisms, cold affusion, Nitrite of Amyl inhalation, or Electricity may be tried, and in *desperate* cases, where the respiratory centre and heart are rapidly failing, boiling water may be used to cause immediate vesication of the skin over the soles of the feet. The hypodermic injection of $\frac{1}{20}$ gr. Strychnine is of unquestionable value, and Mindererus Spirit in 2 oz. doses may be given. Warmth to the surface is essential.

Ammonia and Alkalies.—The stomach-pump should *not* be used. Weak acids (Acetic preferable) may be given, largely diluted, and followed by draughts of Almond or Olive Oil or of melted butter, and demulcent drinks.

Tracheotomy may be required for the œdema of the glottis, and Morphine hypodermically for the shock.

Aniline.—The stomach-pump should be used, and free washing out of the organ accomplished, after which artificial respiration and

Oxygen inhalations, and Strychnine injected hypodermically ($\frac{1}{20}$ gr.) and the treatment detailed under Acid Prussic may be tried.

Antimony (Tartar Emetic).—Stomach-pump or emetics are not generally required, as vomiting sets in soon. Tannin, strong tea, or Gallic Acid, or any diluted astringent tincture or infusion containing tannin may be freely given, followed up by the hypodermic or rectal administration of Alcohol, to which small doses of Digitalis or Strychnine may be added. White of egg, barley water, or linseed tea may be given freely, and the patient kept in the prone position.

Butter of Antimony.—The treatment of poisoning by this preparation of Antimony should be the same as for mineral Acids—viz., Magnesia, Soapsuds, Chalk, Potash, or Soda, followed by Oil and Milk.

Antipyrine.—After stomach-pump, free stimulation by Alcohol, followed by hypodermics of Strychnine ($\frac{1}{20}$ gr.). External warmth and Oxygen inhalations where there is much cyanosis.

Arsenic.—The stomach-pump or emetics, or 10 mins. of Apomorphine injection, should be employed even when vomiting has already taken place. Freshly-prepared moist Peroxide of Iron (prepared by adding Soda or Ammonia to the Tincture of Iron), or Dialysed Iron in ounce doses, diluted, or, in the absence of these, Magnesia freely, or Animal Charcoal, Olive Oil, or Lime Water, must be freely given; demulcent drinks and stimulants by mouth or rectum are also indicated. Large doses of Castor Oil are essential to clear out the intestinal tract and to prevent further absorption.

The following method of using the iron antidote is convenient :—3 ozs. of the strong Liq. Ferri Perchloridi is poured into a pint measure, which is filled up with water; 1 oz. of Calcined Magnesia is then mixed with another pint of water; both solutions or mixtures are then to be thoroughly shaken together, and a dose of one tablespoonful should be given every 5 or 10 minutes.

Atropine and Belladonna.—The stomach-pump or emetics, and afterwards the following are to be given :—Tannin or Tea, Charcoal, Morphine ($\frac{1}{2}$ gr.) by subcutaneous injection, or Laudanum by the mouth, or Pilocarpine ($\frac{1}{2}$ gr.) subcutaneously, followed by purgatives.

The poison being excreted by the kidneys, the bladder should be emptied by the catheter to prevent reabsorption. Eserine in small doses has been advocated as an antagonist, but pilocarpine is better. Free stimulation, counter-irritation, and artificial respiration may be necessary.

Cannabis Indica.—The stomach-pump or emetics, especially Apomorphine hypodermically (10 mins. of B.P. injection), are to be given, and the symptoms treated as they present themselves. It will generally be found necessary to both purge and stimulate.

Camphor.—Stomach-pump or emetics, and copious draughts of water, with brisk Saline cathartics; and general counter-irritation, or cold and hot douches alternately, afford the best means of dealing with this poison.

Cantharides.—Stomach-pump or emetics, mucilaginous drinks, or, in their absence, Oils, Chalk, a little Opium by the mouth, and a Morphine suppository by the rectum, should be used.

Carbolic Acid.—The stomach-pump with its soft rubber tube should be used, after which the organ should be thoroughly washed out with pure Glycerin. Alkaline or Soluble Sulphates, as Epsom or Glauber's Salt, are antidotal, and Schobert gives Saccharated Solution of Lime if the poison is still in the stomach. Give oils, egg albumin, and warm mucilaginous drinks, with any soluble sulphate, and finally, freely stimulate, counter-irritate, and inject $\frac{1}{60}$ gr. of Atropine. Though there is no known antidote, the writer—in a case where half a cupful of the strong acid was taken in a fit of drunkenness—after the contents of the stomach were evacuated, washed that organ out repeatedly with pure Glycerin, using half a gallon of it, the Glycerin dissolving the excess of acid out of the swollen mucous membrane, and the patient made a good recovery. He has since satisfied himself that this is the best treatment whenever the strong acid has been swallowed; it does not interfere with the administration of soluble sulphates.

Iodine is stated to be a true antidote, and 1 oz. of Iodized Starch might be advantageously used along with the water employed in washing out the stomach.

Carbon Monoxide (Carbonic Oxide).—Water gas and coal gas owe their poisonous properties to the amount of this agent in their composition. Artificial respiration must be kept up after the removal of the patient from the poisoned atmosphere, and this must be continued for hours. Inhalation of Oxygen is to be used at the same time freely, and if the heart shows signs of failure, Strychnine may be given, and Faradisation of the phrenic nerves and rhythmic traction of the tongue should be resorted to. If all these fail, and the patient's case appears desperate, venesection should be resorted to, followed by subcutaneous or venous injection of several pints of warm saline solution.

For Carbon Dioxide the same measures may be employed.

Chloral Hydrate.—The stomach-pump or emetics, especially 10 minim injections of Apomorphine Solution, should be used, and these must be followed by injections of Strychnine ($\frac{1}{20}$ gr.) or of Atropine ($\frac{1}{25}$ gr.), Caffeine (5 grs.), or free stimulation with Ammonia, Whisky, or Ether, and Sinapisms. *Particularly external warmth*, Electricity, and artificial respiration; inhalation of Amyl Nitrite may be tried. The patient should be roused and prevented from sleeping, and, as death may occur from the diminution of the body heat, warmth is essential. A pint of strong, warm coffee into the rectum, as advised by Murrell, may save life.

Dougall pointed out that Potash is an antidote to chloral, $\frac{1}{2}$ dr. completely decomposing 80 grs. of chloral. He recommends drachm doses of B.P. Liquor Potassæ, largely diluted, every hour for several doses.

Chlorine, when inhaled, must be treated by inhalations of Ammonia or Sulphuretted Hydrogen. If the poison has been swallowed, it should be neutralised by large quantities of Albumin and mucilaginous drinks.

Chloroform.—When symptoms of an alarming interference with the breathing or circulation come on during anæsthesia, the tongue should be drawn forward, artificial respiration, cold affusion, free ventilation by a current of air, turning over the patient upon his left side, or inversion of the body, may be tried.

Hypodermically — Whisky, Ammonia, Strychnine, or Digitalis, or inhalation of Nitrite of Amyl, may be given. Strychnine is unquestionably the best of these, and may be given hypodermically in one dose of 5 to 10 mins. B.P. liquor. Galvanism is doubtful. If the chloroform has been swallowed, use the pump, or give 10 mins. of Apomorphine Solution, and proceed as if inhaled.

Cocaine.—After the stomach-pump or emetics, fill the stomach with hot strong Coffee and a little Alcohol, and give $\frac{1}{2}$ gr. Strychnine. If the symptoms continue, artificial respiration and oxygen inhalation will be necessary.

Coal Gas.—See Carbon Monoxide.

Colchicum.—Stomach-pump or emetics, mucilaginous drinks, Albumin, or strong Tea or Tannin, should be given, and these should be followed by a purgative, after which free stimulation may be required, and symptoms met as they arise.

Conium.—The stomach-pump or emetics, Tannin, and Castor Oil should be used. Stimulate freely by Ammonia. Hypodermics of Strychnine or Atropine may be tried, and artificial respiration persevered with.

Copper Salts.—The stomach-pump or emetics must be resorted to if free vomiting has not occurred; yellow Prussiate of Potassium, egg Albumin and Milk, which form insoluble Copper Salts, are to be given; mucilaginous drinks, and wheaten flour or water in which yolks of eggs are suspended, and the free use of Opium to allay irritation, are called for.

Corrosive Sublimate.—See Mercury.

Creosote.—The same treatment as for Carbolic Acid.

Croton Oil.—The general treatment for irritant poisons may be used, viz. :—Emetics, or, if in the early stage, the gentle use of the stomach-pump, demulcent drinks, soothing enemata, and Opium. Free stimulation and counter-irritation may be necessary.

Cyanide of Potassium.—Poisoning is to be treated as if Hydrocyanic Acid had been swallowed; and, if seen at once, give Solution of Ferri Sulph. and an alkali; use the alternate hot and cold douche, and give Atropine by hypodermic injection. Whilst the poison is in the stomach Permanganate of Potassium may be given. Antal has proved that Cobaltum Nitricum Oxydulatum has properties powerfully antidotal to the cyanides. A solution of this salt should be given by the mouth if the poison is in the stomach, and if absorption has taken place, he injects from 3 drs. to 1 oz. of a $\frac{1}{2}$ per cent. solution subcutaneously.

Digitalis.—The stomach-pump or emetics, especially Sulphate of Zinc, $\frac{1}{2}$ dr., or 10 mins. of Apomorphine Solution hypodermically,

Tannin, or animal charcoal, free stimulation, and the hypodermic injection of $\frac{1}{120}$ gr. Aconitine, and the free use of Opium, are required. Muscarin ($\frac{1}{3}$ gr.) is antagonistic, and Alcohol should be given. The patient should be kept absolutely quiet, and in the horizontal position.

Elaterium.—Emetics or the stomach-pump must be used. Demulcent drinks and Opium are to be administered freely, and the general treatment of the symptoms of gastro-intestinal irritation is to be followed.

Eserine (or Calabar Bean).—Emetics or the pump, with Tannin or any Tannin-containing liquid, may be employed, but hypodermic injections of Atropine ($\frac{1}{30}$ gr.), till the pupils widely dilate, afford the best chance. Strychnine and Chloral have been recommended.

Artificial respiration should be assiduously tried, with friction and warmth externally.

Ether (Inhalation).—Pull forward the tongue, give free current of air, commence artificial respiration, and try the Konig-Maas method, and treat as if Chloroform poisoning.

Formalin.—Ammonia is decidedly antidotal. Formaldehyde is changed into the comparatively harmless urotropine upon the addition of free ammonia. The best method to pursue in poisoning is to give small doses of ammonia largely diluted with water; or large quantities of Mindererus Spirit—*i.e.*, the liquor ammon. acetatis every half-hour.

Fungi (or Muscarin).—Emetics or the pump should be used, and Atropine given hypodermically ($\frac{1}{40}$ gr.), and repeated till the pupils dilate, or Digitalis, or Morphine, may be given. Free stimulation, sinapisms, and friction may be required.

Gelsemium.—The stomach-pump and emetics are to be used, and Bicarbonate of Potassium and Tannin freely given; warmth, free stimulation with Alcohol, electricity, and artificial respiration are to be kept up.

Hypodermics of Ammonia or Atropine, or Digitalis, are partially antagonistic. The best result will follow 3 mins. of Atropine Solution.

Hydrocyanic (or Prussic) **Acid.**—Antidote and treatment are described under Acid Prussic.

Hyoscyamus.—Same as for Atropine.

Iodine.—Emetics or the *cautious* use of the rubber tube of the stomach-pump should be employed, together with the free administration of starch, arrowroot, bread, boiled potatoes, or flour, lime water, and demulcent drinks.

Iodoform.—Emetics or the stomach-pump, and large diluted doses of Bicarbonate of Soda, followed by free stimulation and a hot pack. Saline solution injected hypodermically in large doses is recommended by Kocher.

Laburnum.—The stomach-pump, if possible, should be always used, even if vomiting has occurred, as portions of seeds, etc., may remain in the stomach. Free stimulation, and, in bad cases, hypo-

dermic injection of Ammonia. Counter-irritation, friction, and the cold douche are necessary, after which a brisk purgative should be administered.

Lead Salts.—The stomach-pump, or preferably, a large emetic of Sulphate of Zinc, which is also an antidote, should be given, and followed by milk, white of egg, diluted Sulphuric Acid, Epsom or Glauber's Salt, or Phosphate of Sodium, Sulphuretted Hydrogen, or Harrogate water. Demulcent drinks, with mild Opiates to allay pain and spasm, may be administered.

Lime.—Carbonic Acid—any Aërated water, as soda water or lemonade—is very useful; or weak Acetic Acid or Vinegar, freely diluted, and followed by Oil or demulcent drinks, may be swallowed.

Lobelia and Tobacco.—Emetics or the pump should be employed, as should also Tannin, and free stimulation externally by sinapisms, friction, and dry heat; internally or hypodermically Alcohol, Ammonia, and Ether, with Strychnine ($\frac{1}{20}$ gr.), and small doses of Opium. The patient must be kept strictly in the horizontal position.

Mercury (Corrosive Sublimate).—Emetics, or the very cautious use of the soft tube will be required. (The pump should not be used except in the very early stages of the poisoning.) Albumin, or Glutin (prepared by washing flour in a muslin bag), demulcent drinks, milk, and oil are to be given by the mouth, and Morphine and Alcohol subcutaneously.

Morphine.—See Opium.

Muscarin (or Poisonous Mushrooms).—Same treatment as in poisoning by Fungi—viz., the subcutaneous administration of Atropine after the use of an emetic or the pump.

Nitric Acid.—See under Acids, Mineral.

Nitro-Benzole.—The stomach-pump should be used, and a stream of warm water passed through it. Alcohol and fats must not be used—the main reliance being placed upon counter-irritation by Mustard, artificial respiration, and Galvanism, and measures useful in Prussic Acid poisoning.

Nux Vomica.—See Strychnine.

Opium (or Morphine).—The stomach-pump, or, in its absence, emetics (if capable of swallowing), must be resorted to, or $\frac{1}{10}$ gr. of Apomorphine injected hypodermically. The stomach should be washed out with tepid water containing potassium permanganate, and filled with strong coffee or tea, or any infusion or liquid containing Tannin. Owing to the fact that the mucous membrane of the stomach continues to excrete the poison, it has been advocated that it is of the greatest importance in all severe cases that the stomach be repeatedly washed out at short intervals during the treatment.

Permanganate of Potash has been demonstrated to be a chemical antidote to morphine, weight for weight, and as it can do no harm it should be given immediately without waiting for vomiting (5 grs. in 2 ozs. water). It should be also given after the poison has passed out of the stomach, as it is excreted again by the mucous

membrane later on, and the stomach should be repeatedly washed out with the solution. Binet, as the result of much experimentation, has, however, proved that no excretion takes place except in infinitesimal quantity, and he considers that the repeated washings out are valueless. There cannot, however, be any doubt about the great value of washing out the stomach by a solution of the drug at first.

Caffeine, Atropine, or Strychnine hypodermically is to be administered. This latter should be repeated frequently as long as there are dangerous cardiac or respiratory symptoms; $\frac{1}{30}$ gr. may be given every 2 or 3 hours. Flagellations, cold and hot affusions alternately, electricity, extensive sinapisms, or very hot water, to cause vesication in desperate cases, must be employed to rouse the patient, and when once roused he should never be allowed to fall asleep again, but should be kept continually awake, though every care must be exercised lest this should be carried too far so as to induce exhaustion, as is, unfortunately, often done. Artificial respiration may be required, and this must be kept up assiduously as long as the number of respirations remains below normal. The dose of Atropine should not exceed $2\frac{1}{2}$ mins. of the liquor, and should not be repeated. A larger dose only reinforces the action of the morphia.

Oxalic Acid.—The pump or emetics must be used. Lime (lime water, putty of lime, or chalk) is the best antidote; one good dose of Castor Oil, counter-irritation, free stimulation, and the treatment for gastro-enteric inflammation should be followed.

Phosphorus.—The pump or emetics will be necessary. Sulphate of Copper, 5 grs. every 15 minutes, is both antidote and emetic, and the stomach may be freely washed out with a dilute solution of this salt after the contents have been evacuated. Permanganate of Potassium, 5 grs. in 1 oz. water, or Peroxide of Hydrogen, will act as an efficient antidote. French Oil of Turpentine, or any *old* Oil of Turpentine, purgatives, and demulcent drinks containing Magnesia and Albumin should be swallowed. Oils and butter should be avoided.

Pilocarpine.—The stomach-pump or emetics will be required, together with the free administration of Tannin and the hypodermic use of its antagonist, Atropine, in $\frac{1}{60}$ to $\frac{1}{30}$ gr. doses.

Physostigma.—See under Eserine.

Potash, Caustic.—Emetics must be administered. The pump should *not* be used. Weak Acids (Vegetable preferred, and largely diluted), Oils, and butter may be freely administered. The after-treatment will consist in rectal feeding, and, after the danger of perforation has passed away, the free use of barley water, linseed tea, and other demulcents.

Potassium Chlorate.—The pump or emetics and profuse demulcent drinks and purgatives are indicated, along with hot blanket baths and the treatment for Acute Bright's Disease.

Silver Nitrate (or Lunar Caustic).—Large doses of common Salt or Sea Water should be swallowed. Emetics and the pump (indiarubber tube) should be used, and white of eggs injected into the

stomach after the poison is removed. Yolk of egg, wheaten flour, or milk mixed with water, should be freely administered.

Soda, Caustic.—Acids and Oils will be required (as for Potash).

Stramonium.—Emetics, Tannin, free stimulation, and hypodermic use of Morphine are the necessary treatment (same as for Atropine and Belladonna).

Strychnine.—The pump should only be used before spasms have appeared; emetics, especially a hypodermic injection of $\frac{1}{10}$ gr. Apomorphine, must be given, followed by Charcoal or Tannin in large quantities. Tobacco by rectum (with great caution—not more than 20 grs. at once), Bromide of Potassium in large doses (2 drs. to 2 ozs.), Chloral, Chloroform, Calabar Bean, Conium, Morphine, Ether, etc., are recommended. The writer has found by experience that poisonous doses of *Alcohol* afford the best treatment, given both by mouth and rectum. Artificial respiration may be tried. Chloroform inhalation may be kept up as long as the convulsions are severe. If the spasms continue in spite of the above treatment, spinal anæsthesia by the injection of 1 c.c. of Barker's 5 per cent. solution of Stovaine may be induced by lumbar puncture. Permanganate of Potassium, if given immediately after a poisonous dose, would probably act as an antidote.

Sugar of Lead.—Sulphate of Zinc, Albumin, etc., should be given. (See Lead.)

Sulphonal.—Emetics or the use of the stomach-pump; after the organ has been thoroughly washed out, hot strong coffee should be injected, and a hypodermic dose of Strychnine administered. It may be necessary to resort to artificial respiration, which should be assiduously kept up as long as the number of respirations keeps below the normal. A drop of croton oil should be placed on the back of the tongue in cases where the drug has been swallowed a considerable time before the physician has been summoned.

Sulphurets and Sulphuretted Hydrogen.—Inhalation of air containing a small percentage of Chlorine in it, and the free administration of a very weak solution of Chlorinated Lime or Soda or Iodised Starch, constitute the necessary treatment.

Sulphuric Acid.—See under Acids, Mineral.

Tartar Emetic.—Tannin, Green Tea, etc., should be administered. (See Antimony.)

Tobacco.—Emetics, Tannin, free stimulation, and hypodermic injection of Strychnine ($\frac{1}{10}$ gr.) are indicated, and the recumbent position must be strictly maintained (as for Lobelia).

Veratrine.—The pump or emetics must be used, followed by Alcohol, Opium, etc. (as for Aconite, which see).

Zinc Salts (chiefly the Chloride, as Burnett's Fluid).—The rubber tube of the stomach-pump, if employed, should be used with caution, or emetics, especially Apomorphine ($\frac{1}{10}$ gr.), may be injected hypodermically. Egg Albumin, Oils, Tea, Tannin, Milk, Alkalies or their Carbonates, demulcent drinks, and soothing enemata containing a little Laudanum, are to be administered.

INDEX

A

A B C Liniment	...	313	Acid, Blatic	...	524
Abernethy's Lotion	...	301	„ Boracic or Boric	...	
Ablution	...	57	„	112, 177, 302	
Abrastol	...	490	„ Cacodylic	300, 491	
Abrin, Abrus Prec.	...	571	„ Camphoric	...	492
Absinthium	...	490	„ Carbazotic	...	496
Absolute Alcohol	185, 315		„ Carbolic	112, 178, 303	
Absorbents	...	103	„ „ in pill	...	34
Abstracts	...	152	„ Cathartic	278, 492	
Acacia Cortex	...	618	„ Chromic	112, 178, 304	
„ Gummi	136, 175, 296		„ Chrysophanic	...	213
Acalypha	...	618	„ Cinnamic	...	492
Accumulation	...	79	„ Cinnamylic	...	492
A.C.E. Mixture	314, 360		„ Citric	112, 179, 305	
Aceta, B.P.	...	146	„ Coumaric	492, 538	
Acetanilide	112, 175, 296		„ Cresotic	...	311
„ Comp. Powder	297, 503		„ Cresotinic	...	493
Acetic Acid	112, 175, 297		„ Cresylic	...	493
„ Ether	115, 185, 315		„ Dibromogallic	...	552
Acetocaustin	...	498	„ Dichloracetic	...	498
Acetone	...	491	„ Ergotinic	...	223
„ -chloroform	...	491	„ Eugenic	...	545
Acetophenone	...	565	„ Formicum	...	494
Acetopyrine	...	491	„ Gallic	113, 179, 305	
Acetozone	...	520	„ „ in pill	...	35
Acetyl-Atoxyl	...	518	„ Glycerophosphoric	494	
Acetylene	...	528	„ Gynocardic	...	532
Acetylphenylhydrazin	...	503	„ Hydrobromic	113, 179, 306	
Acetysal	518, 599		„ Hydrochloric	...	
Acid, Acetic	112, 175, 297		„	113, 179, 306	
„ Acetyl Salicylic	...	518	„ Hydrocinnamic	...	492
„ Agaric	...	500	„ Hydrocyanic, Dilute	...	
„ Alginic	...	548	„	113, 180, 308	
„ Alpha-Oxynaphthoic	491		„ Hydrocyanic, Scheele	180	
„ Anacardic	...	504	„ Hydrofluoric	...	495
„ Arseniosum	176, 298		„ Hypochlorous	345, 471	
„ Benzoic	177, 301		„ Hypophosphorous	...	496
			„ Iodic	...	496
			„ Lactic	113, 180, 309	

Acid, Mineral, Poisoning by	626	Adepsine-Oil	... 432
„ Monochloracetic	... 498	Adhatoda	... 618
„ Nitric	113, 180, 306	Adhesive Plaster	... 269
„ Nitro-Hydroch.	113, 180, 310	Adjuvant, in a Recipe	... 87
„ Nucleic or Nucleinic	584	Administration of Medi-	
„ Nucleotin-phosphoric	584	cines	... 74
„ Oleic	113, 180, 310	Adnephryn	... 606
„ Ophelic	... 212	Adonidin	... 498
„ Osmic	... 496	Adonis Vernalis	... 498
„ Paracresotinic	... 493	Adrenalin	... 606
„ Perosmic	... 496	Adren-ol Solution	... 606
„ Phosphoric	114, 181, 310, 437	Æscorcin	... 499
„ Picric	... 496	Æsculap Water	... 475
„ Prussic	180, 308	Æsculin	... 499
„ Pyrogallic	... 497	Æsculus Hippocastanum	499
„ Quinic	... 497	Æther (see under Ether)	
„ Ricinoleic	271, 458, 598	„ Sulphuric	... 184
„ Salicylic	114, 181, 310	Æthyl (see under Ethyl)	
„ Sclerotic	223, 498	Affusion	... 57
„ Sozolic	... 518	Agar Agar	... 500
„ Sphacelinic	223, 380	Agaric Acid	... 500
„ Succinic	... 605	Agaric, Fly	... 580
„ Sulphocarbolic	... 518	„ White or Purging	500
„ Sulphuric	114, 181, 306, 312	Agaricin	... 500
„ Sulphurous	114, 182, 312	Agaricus Albus	... 500
„ Tannic	182, 305	„ Muscaria	... 580
„ „ in Pill	... 35	Age in Posology	... 77
„ Tartaric	114, 183, 305, 312	Agitation	... 57
„ Thyminic	... 584	Agropyrum	612, 618
„ Trichloracetic	... 498	Agurin	... 609
„ Trichlorphenic	... 498	Air Bath (Hot)	... 330
„ Trinitro-phenic	... 496	Airoform	... 523
„ Valerianic	... 524	Airogen	... 523
„ Vanillic	... 614	Airol	... 523
Acidol	... 521	Ajacol	... 557
Acids, Theory of the Action		Ajowan Oil	... 622
of	... 103	Alabastrine	... 581
Acocantherin	... 586	Alantol	... 560
Acoin	... 536	Albargin	... 501
Aconitina	183, 312	Albo Carbon	... 581
Aconitum	141, 183, 312	Alboferine	... 548
Actæa Racemosa	141, 213, 362	Albumen Ovi	... 429
Actol	... 498	Albumin, Milk	... 545
Adeps	183, 313	Alcohol Absolutum	185, 315
„ Benzoatus	183, 313	„ (90%, 70%, 60%, 45%, 20%,)	284, 285, 315
„ Induratus	... 624	„ Salicylic	... 600
„ Lanæ	184, 313	Ale	... 317
„ „ Hydrosus	... 184	Alembroth Salt	501, 562
Adepsine	... 589	Alginoid Iron	... 548
		Alkalies	103, 446

Alkalies and Quinine (in Mixt.)	... 16	Ammoniated Mercury	... 238
Alkaline Bath	... 472	" Tincture of Quinine	269
Alkaloids	... 173	Ammonio-Mercuric Chloride	238, 501, 562
Allen's Paste	... 301	Ammonium (Official Preparations)	115, 188, 319
Allium	... 501	" Alum	... 187
Allmatein	... 501	" Fluoride	... 495
Allspice	... 259	" Ichthyolate	566
Allyl Sulphide	... 501	" Iron Alum	... 502
" Sulpho-Carbamide	... 550	" Picrate	... 496
" Thio-Urea	... 550	" Tart. C. Hydrargyrol	563
Almond Oil, in Mixture	... 16	" Tumenol	... 565
Almonds, Sweet and Bitter	141, 142, 189, 322	Amygdala	141, 142, 189, 322
Aloes, Barb. and Socot.	138, 185, 317	Amygdophenin	... 535
" in Pill	... 34	Amyl Colloid	... 503
" Decoct. Excipient	25	" Hydride	520, 597
Aloinum	186, 318	" Isobutyl	... 323
Alpha-Cerebrin	... 525	" Nitris	116, 190, 323
Alpha-Naphthol	... 582	" Salicylate	503, 553
Alphogen	... 605	" Valerianate	... 524
Alphol	... 521	Amylene Chloral	... 503
Alphozone	... 605	" Hydrate	... 503
Alsol	... 502	Amyli Bromidum	... 504
Alstonia	... 618	" Chloridum	... 504
Alteratives	... 103	" Iodidum	504, 568
Althæa	... 501	Amyloform	... 551
Althein	... 502	Amylopsin	... 429
Altingiaceæ	... 138	Amylum	135, 190, 324
Alumen Ammonio-Ferric.	502	Amyridaceæ	... 130
Alumen (Official)	115, 187, 319	Anacardium	... 504
Alum, Iron	... 502	Anæsthesine	... 504
Aluminii Acet. Liq. P.G.	502	Anæsthetics	... 104
Aluminium	... 499	Analgen	... 504
" Salts (Non-Official)	... 502	Analgesics	... 104
" Salicylate	... 600	Analysis	57, 67
" Silicate	243, 552	Anaphrodisiacs	... 104
" Sulphate	187, 319	Anarcotine	... 582
Alumol	... 502	Anderson's Ointment	... 522
Alypin	... 502	Andrographis	... 618
Amanita Muscaria	... 580	Anemonin	... 592
Amber	... 605	Anestile	... 500
American Indian Hemp	... 515	Anethum	145, 191, 324
Aminoform	... 613	Angostura	142, 222
Aminoketone	... 606	Anhalonium Lewinii	... 504
Ammonal	... 503	Anhidrotics	... 104
Ammonia	115, 188, 319	Aniline Blue	... 579
Ammoniacum	144, 187, 319	" Red	... 551
Ammoniated Arsenio-citrate of Iron	... 548	Anise (Star)	139, 191

- | | | | |
|--------------------------|---------------|----------------------------|----------|
| Anisum | 145, 191, 324 | Anti plague Serum and | |
| Anodyne Colloid | ... 503 | Vaccine | ... 510 |
| " Hoffman's | ... 184 | Antipneumococcic Serum | |
| Anodynens | ... 104 | and Vaccine | ... 510 |
| Antacids | ... 103 | Antipyretics | ... 105 |
| Antagonists | ... 104 | Antipyrine | 257, 434 |
| Anthemis | 132, 192, 324 | " Acetosalicylate | 491 |
| Anthelmintics | ... 104 | " Amygdalate | ... 593 |
| Anthracene Purgatives | ... 107 | " Caffeno-citrate | 528 |
| Anthrapurpurin | ... 592 | " Camphorate | ... 593 |
| Anthrarobin | ... 505 | " Monobromide | 526 |
| Anthrasol | ... 505 | " Salicylate | ... 593 |
| Antianthrax Serum and | | Antirheumatin | ... 579 |
| Vaccine | ... 506 | Antirheumin | ... 495 |
| Antiarthrin | ... 499 | Antiscotics | ... 104 |
| Anticancer Serum | ... 507 | Antiseptin | 503, 505 |
| Anticatarthal Vaccines | ... 507 | Antiseptics | ... 105 |
| Anticerebro-Spinal Fever | | Antiseptin | ... 505 |
| Serum | ... 507 | Antiseptol | 505, 534 |
| Anticholera Serum and | | Antisera | ... 506 |
| Vaccine | ... 507 | Antisialics | ... 105 |
| Anticolin | ... 572 | Antispasmodics | ... 105 |
| Anticolon Bacillus Serum | | Antispasmin | ... 582 |
| and Vaccine | ... 508 | Antistaphylococcic Vaccine | 511 |
| Antidiphtheria Serum | ... 508 | Antistreptococcic Serum | |
| Antidote, General | ... 626 | and Vaccine | ... 511 |
| Antidotes | ... 105 | Antitetanus Serum | ... 512 |
| Antidysentery Serum and | | Antithyroid Serum | ... 512 |
| Vaccine | ... 509 | Antithyroidin-Moebius | ... 512 |
| Antiendotoxin | ... 515 | Antitoxine | ... 503 |
| Antifebrin | 175, 296 | Antitoxins (various) | ... 505 |
| " Derivatives | ... 503 | Antitoxin Units | 508, 512 |
| Antiglanders Vaccine | ... 509 | Antituberculosis Serum | |
| Antigonorrhœa Serum and | | and Vaccine | ... 513 |
| Vaccine | ... 509 | Antitussin | ... 495 |
| Anti-Hay Fever Serum | ... 509 | Antityphoid Serum and | |
| Antihydropin | ... 524 | Vaccine | ... 514 |
| Antikamnia | ... 503 | Antivenene | ... 515 |
| Antileprosy Serum and | | Anusol | ... 596 |
| Vaccine | ... 510 | Anytin and Anytols | ... 566 |
| Antilithics | ... 105 | Aperients | ... 106 |
| Anti-Malta Fever Serum | | Aperione | ... 589 |
| and Vaccine | ... 510 | Aphrodine | ... 616 |
| Antimeningococcic Serum | 507 | Aphrodisiacs | ... 106 |
| Antimonium (Official) | | Apiol | ... 515 |
| | 116, 192, 324 | Apiol Camphor | ... 515 |
| Antinervin | 503, 599 | Apioline | ... 515 |
| Antinosin | 524, 583 | Apocodeine | ... 515 |
| Antiparasitics | ... 105 | Apocynaceæ | ... 139 |
| Antiperiodics | ... 105 | Apocynin | ... 515 |
| Antiphlogistics | ... 105 | Apocynum Cannabinum | ... 515 |
| Antiphlogistine | ... 542 | Apolysin | ... 535 |

Apomorphine	117, 193,	326
" Methyl Bromide		547
Aqua	193,	328
" Fluoroformi	...	495
Aquæ, B.P.	...	146
Aquapuncture	...	331
Arabic Gum	136, 175,	296
Arachis Oil	...	622
Araroba	137, 193	
Arbor Vitæ	...	611
Arbutin	291, 486,	515
Arecolinae Hydrobromas		516
Argentamin	...	516
Argenti Acetas	...	571
" Albuminas	...	574
" Citras	...	570
" Fluoridum	...	496
" Ichthyolas	...	567
" Iodidum	...	517
" Lactas	...	498
" Nitras	117, 194,	331
" Nucleas	...	584
" Oxidum	117, 194,	332
" Phosphas	...	516
" Quinaseptolas	...	516
Argentol	...	516
Argentum Colloidale	...	516
Argentum (see also Silver)		
Argonin	...	516
Argyrol	...	517
Arheol	...	601
Aristochin	...	594
Aristol	517,	568
Aristolochia	...	618
Aristolochiaceæ	...	130
Aristoquinine	...	594
Armoracia	134, 194,	332
Arnica Flores	...	619
Arnica Rhizoma	132, 195,	333
Aromatic Powder	...	215
Aromatic Syrup	...	273
Aromatics	...	106
Arrhenal	...	517
Arrow Poison, South American		
" " Somali	...	539
" " "	...	585
Arsamin	...	517
Arsenic	176,	298
Arsenio-Citrate of Iron	...	548
Arseniohæmol	...	560
Arsenious Anhydride (Acid or Oxide)	176,	298
Arsenoferratose	...	548
Arsinyl	...	517
Arsycodile	...	491
Artemisin	...	490
Arterenol	...	606
Artmann's Creolin	...	493
Asafetida	144, 195,	333
Asafetidæ, Pil. Co.	...	229
Asaprol	...	490
Asclepiadaceæ	...	130
Aseptol	...	518
Aseptoline	...	591
Asiatic Pills	...	301
Asparagin	...	502
" c. Hydr. Oxid.		563
Aspen	...	520
Aspidospermine	...	518
Aspirin	518,	599
Aspirophen	...	519
Asterol	...	563
Asthma Cures	...	475
Astringents	...	106
Atoxyl	...	517
Atropine	143, 196,	333
Atropine Methyl Bromide		546
" " Nitrate		545
Auramine	...	578
Aurantiacæ	...	131
Aurantii Cort. Indicus	...	619
" Flores	131, 197,	336
Aurantium	131, 196,	336
Auri et Sodii Chlor.	...	519
Auxiliary in a Recipe	...	87
Ava Ava	...	572
Avoirdupois Weights	68,	83
Azadirachta Indica	...	619
B		
Bacillus Coli Serum and Vaccine	...	508
Bael Fruit	...	619
Baking Soda	...	281
Balsam, Canada	...	289
" Dipterocarpi	...	559
" Friar's	200,	336
" Gurjun	...	559
" of Peru	137, 197,	336
" of Tolu	137, 198,	336
Balsams	...	174
Baly's Pill	...	379
Baptisin	...	516

Barbados Aloes	138, 185, 317	Beta-naphthol, Benzoate	520
Barberry, Holly-leaved	... 520	" Camphorated	582
Barium Salts	... 519	" Carbonate	582
Barker's Solution	... 544	" Diiodide	... 582
Basham's Mixture	... 385	" Lactate	... 520
Basilicon Ointment	... 269	" Salicylate	521
" Oint. Excipient	26	Betaine	... 521
Basis, in a Recipe	... 87	Betel	... 619
Bassorin Paste	... 553	Betol	... 521
Bath, Alkaline	... 472	Bhang	... 347
" Mustard	... 469	Bile, Purified Ox	225, 382
" Nauheim	... 330	" Salts	... 521
" Sulphur	... 530	Biolactyl	... 572
Baths, Therapeutics of	... 329	Birch Oil, Sweet	... 552
" Water, Sand, and		Bisciniod	522, 534
Steam	... 62	Biscol	... 522
Battley's Sedative	... 253	Bismal	... 523
Bay Rum	... 519	Bismone	... 522
Bazin's Ointment	... 564	Bismuth (Official)	117, 201, 337
Bearberry Leaves	134, 291	" in a Mixture	... 17
Beeswax	211, 355	" Salts (Unofficial)	
Beetles	207, 348, 524, 621		521, 597
Belæ Fructus	... 619	Bismuthol	... 523
Belladonna	143, 198, 333	Bismutose	... 523
Belladonnæ Chloroformum	336	Bitter Almonds	141, 189, 322
Bengal Kino	... 619	" Apple	134, 218
Benger's Food	... 430	" Orange	... 131
Benzene	200, 519	Black Draught	... 278
" Isopropyl	... 539	" Haw	615, 623
" Trimethyl	... 539	" Pepper	... 140
Benzine	519, 589	" Sassafras	... 622
Benzoated Lard	... 183	" Snake Root	... 141
Benzoic Acid	177, 301	" Wash	122, 237, 397
Benzoin	144, 200, 336	" Wattle	... 618
Benzol	200, 336	" Willow	... 600
Benzoline	... 519	Bladder Seawrack	... 551
Benzonaphthol	... 520	Blatta Orientalis	... 524
Benzosalin	... 520	Blattic Acid	... 524
Benzosol	520, 558	Blaud's Pill	227, 385
Benzoyl-Acetyl Peroxide	520	Bleaching Powder	... 204
" Eugenol	... 545	Bleeding	... 391
" Naphthol	... 520	Blenosan	... 601
" Pseudotropeine	535	Blisters, Dispensing of	... 47
" Salicin	... 520	" Therapeutics of	348
" Thymol-Sodium		Blistering Collodion	208, 218
Oxybenzoate	520	" Liquid	... 208
Benzylmorphine	... 588	" Plaster	... 207
Berberidaceæ	... 131	Blood (Ox)	... 560
Berberine	238, 398, 520	" Root	... 600
Berberis	... 619	Bloxam's Solution	... 501
Berberis Aquifolium	... 521	Blue Cohosh	... 532
Beta-naphthol	252, 420	" Flag	... 570

641

41

Calcium Permanganate ...	529	Caoutchouc	134, 208, 351
„ Phos., Excipient	26	Caprifoliaceæ	... 131
„ Sulphide in Pill...	34	Capsicum	143, 208, 351
Calculus	... 591	Capsule Making	... 40
Calmette's Tuberculin	... 514	Caraway	144, 209, 324
Calomel	237, 393	Carbamide	... 613
„ Hypoderm. Inject.	562	Carbanilic Ether	... 546
„ Vegetable	... 445	Carbazotic Acid	... 496
Calotropis	... 619	Carbo Ligni	208, 352
Calox	... 529	Carbol Lysoform	... 576
Calumba	139, 205, 345	Carbolic Acid	112, 178, 303
Calx	203, 343	„ Colloid	... 536
„ Chlorinata	119, 204, 345	„ Lotion	... 304
„ Sulphurata	204, 345	„ Oil	... 304
„ Sulph., in Pill	... 34	„ in Pills	... 34
Cambogia	135, 205, 346	Carboluria	... 304
„ Indica	... 619	Carbon Bisulphide	119, 208, 352
Camelliaceæ	... 131	Carbonic Acid Gas	... 530
Cameroon Tree	... 616	Carbonic Snow	.. 531
Camphoid	... 529	Carbonis Detergens Liq.	441
Camphor	136, 205, 346	„ Tetrachlorid.	... 531
„ Monobromata	... 530	Carbonization	... 58
„ Naphthol	529, 582	Cardamoms	145, 209, 353
„ In Pill	... 34	Cardin	... 531
„ Phenol	... 529	Cardol	... 504
„ Pulsatilla	... 592	Carica	531, 587
„ Resorcin	... 597	Carlsbad Salt	474, 531
„ Salicylate	... 529	Carminatives	... 106
„ Salol	... 529	Carniferrin	... 549
Camphorate of Antipyrine	593	Caroba or Carobinha	... 571
„ of Pyramidon	593	Carron Oil	204, 344, 412
Camphorated B.-Naphthol	582	Carpane	531, 587
„ Oil	... 206	Carui Fructus	144, 209, 324
Camphoroxol	... 578	Caryophyllum	140, 209, 353
Camphosan	... 530	Casca Bark	... 531
Camphossil	... 529	Cascara Sagrada	141, 210, 353
Camphylene	... 581	Cascarilla	134, 210, 354
Canada Balsam	... 289	Casein	532, 545
„ Turpentine	133, 289, 481	Caseo-iodine	... 568
Canadian Hemp	... 515	Cashew Nut	... 504
Canadine	238, 398	Cassia Pulpa	137, 210, 354
Cannabin Tannas	... 530	Castanea	... 499
Cannabinaceæ	... 131	Castor in Mixture	... 16
Cannabinol	206, 530	Castor Oil	134, 271
Cannabinon	... 530	Casumen	532, 545
Cannabis Indica	131, 206, 347	Cataphoresis	... 75
„ in Mixture	.. 16	Cataplasma Kaolini	... 542
Cantharis	207, 348	Cataplasmata, Therapeutics	
Cantharidin	207, 530	of	... 330
Cantharidinate of Potash	348, 530	Catechu	132, 211, 354
		„ Nigrum	... 619

Cathartics	...	106	Chimaphila Umbellata	...	533
Cat's Hair	...	546	Chinaphenin	...	594
Caulophyllin	...	532	Chinaseptol	518,	540
Caustic, Lunar	...	194	Chinoform	...	594
" Mitigated	...	194	Chinoidine	...	594
" Potash	263,	447	Chinolinum	...	533
Caustics	...	108	Chinosol	...	533
Cayenne	208,	351	Chinotropine	...	614
Cedrarine	...	585	Chirata or Chiretta	135,	212, 355
Cedron	...	532	Chloralamide	...	534
Celandine	...	533	Chloral Camphor	356,	529
Celastraceæ	...	132	Chloral Formamide	...	534
Celloidin	...	532	Chloral Hydras	119,	212, 355
Cellotropine	...	516	Chloral Menthol	...	356
Centimil	4,	73	Chloralimide	...	534
Cephaeline	240,	542	Chloralose	...	534
Cera Alba	211,	355	Chloral Urethane	...	602
" Flava	211,	355	Chloretone	...	491
Cerasin	...	532	Chloric Ether	...	213
Cerebrin	...	525	Chloride of Lime	...	204
Cerebrum Siccum	...	525	" of Starch	...	504
Ceresin	...	532	Chlorinated Lime	119,	204, 345
Cereus Grandiflorus	...	527	Chlorine	357,	545
Cerii Oxalas	119,	211, 355	Chlormethyl	...	578
" et Bism. Salicyl.	...	523	Chlorobrom	...	534
Cetaceum	211,	355	Chlorodyne	...	212
Cetrarin	...	532	Chloroform	120,	212, 357
Cevadilla	139,	292, 487	" of Belladonna	...	336
Ceyssatite	...	542	Chloroformic Digitalin	...	540
Chalk, French	...	542	Chlorphenol	587,	588
" Precipitated	203,	343	Chlorsalol	...	588
" Prepared	220,	343, 373	Chocolate Tree	...	143
Chamomile Flowers	132,	192, 324	Cholagogue Purgatives	...	106
Charcoal	208,	352	Cholagogues	...	107
Charta Sinapis	147,	280	Cholesterin	...	521
Chaulmoogra Oil	532,	622	Choline	...	521
Chebulic Myrobalans	...	621	Chrisma	...	589
Chekan	...	581	Chrismaline	...	432
Chelidonine	...	533	Christmas Rose	...	560
Chelidonium Majus	...	533	Chromic Anhydride (or		
Chelsea Pensioner	...	390	Acid)	112,	178, 304
Chemical Food (Parrish's)	385,	549	Chrysarobin	137,	213, 361
" Incompatibility	80		" Acetate	...	547
" Reactions	...	112	" Crude	...	193
Cherry Bark, Wild	...	455	Chrysophanic Acid	...	213
" Laurel Leaves	142,	244	Ciliary Body Extract	...	556
Chestnut, American, Horse			" Excitants	107,	321
and Spanish	...	499	Cimicifuga	141,	213, 362
Chian Turpentine	...	533	Cimolite	...	542
Chili Paste	208,	351	Cinchona	132,	214, 362
			Cinchonaceæ	...	132

Cinchonidine and Cincho- nine ...	534	Colchisal ...	536
" and Bismuth		Cold Cream ...	271
Iodide ...	522	Coley's Fluid ...	507
Cinchonine Iodosulphate	505	Collinsonia ...	536
Cinchonism ...	362	Collargol ...	516
Cineol ...	545	Collodia, B.P. ...	147
Cinnabar ...	564	Collodion 218, 369, 532	
Cinnaldehyde ...	492	Iodine ...	537
Cinnamal ...	492	Salicylic ...	536
Cinnamic Acid ...	492	Salol 462, 537	
Cinnamomum 136, 215, 366		Colloid, Amyl or Anodyne	503
Cinyl Alcohol ...	608	Carbolic ...	536
Cissampelos ...	620	Mercury 562, 564	
Citarin ...	551	Salicylic ...	536
Citral ...	411	Silver ...	516
Citrate of Iron and Qui- nine Pills ...	34	Styptic ...	536
Citric Acid 112, 179, 305		Colloidal Bismuth Oxide	522
Citrine Ointment ...	236	Collyria, Compounding of	17
Citrophen ...	534	Colocynth 134, 218, 369	
Clark's, Sir A., Pill ...	318	Colonial Addendum to B.P.	
" Hay Fever			618
Remedy 304		Colourless Iodine ...	406
Claret ...	319	Combination of Medicines	82
Clarification ...	58	Combretum ...	537
Cleaver's Grass ...	552	Comminution ...	58
Cloves 140, 209, 353		Compositæ ...	132
Coal Tar, Prepared 260, 441		Compounding, Definition	1
Cobalto-Nitrite of Potas- sium ...	535	Concentrated Infusions 54, 158	
Coca and Cocaine		Condurango Bark ...	537
134, 216, 366, 536		Condy's Fluid ...	265
Cocaine Collodion ...	536	Conephrin ...	606
Cocaine-lanolin ...	536	Confectiones, B.P. ...	147
Cocaine-Menthol-phenol	536	Confections, Compounding	
Cocaine Salts (Unofficial)	535	of ...	18
Cocaine Substitutes		Coniferæ ...	133
502, 536, 544, 561, 583 (2),		Coniine ...	536
585, 604		Conium 144, 219, 370	
Cocainomania ...	367	Conserves, Compounding of	18
Coccus (Cochineal) 217, 367		Contusion, Process of ...	58
Cockroaches ...	524	Convallamarin ...	537
Cod Liver Oil 251, 417		Convallaria Majalis ...	537
" and Malt ...	577	Convallarin ...	537
Codeine 217, 253, 368, 428		Convolvulaceæ ...	133
Codrenine ...	606	Convolvulin ...	242
Coffee ...	132	Cooper's (Sir A.) Ointment	301
Cohosh, Blue ...	532	Copaiba or Copaiva	
Colation ...	62	137, 219, 372	
Colchicine ...	536	" Paste ...	375
Colchicum 139, 217, 218, 368		" Pills ...	34
		Copper Aseptol ...	518
		Copper Sulphate 120, 222, 375	
		Coriandrum 144, 220, 324, 372	

645

Corking of Bottles	...	14	Croton Oil in Pill	...	34
Corn Ergot	...	614	Croton-chloral Hydrate	...	202
„ Silk	...	616	Cruciferae	...	133
„ Smut	...	614	Crurin	...	524
Cornutine	223, 380,	543	Cryogenin	...	539
Coronillin	...	537	Crystallisation	...	59
Corrective, in a Recipe	...	87	Crystals, in Mixtures	...	11
Corporea Lutea Substance	...	555	„ in Ointments	...	43
Corrosive Sublimate	237,	395	Cubeba	140, 221,	37
Coryfin	...	537	Cucurbitaceae	...	134
Coryl	...	500	Cucurbitae Sem. Ppt.	...	620
Corylaceae	...	134	Culver's Root	...	574
Cosmoline	...	589	Cumol or Cumene	...	539
Coscinium	...	620	Cumulative Action	...	79
Cotarnine	398,	605	Cupful	...	85
Coto Bark	...	538	Cuprargol	...	584
Cotoin	...	538	Cupri Sulphas	120, 222,	375
Cotton Root Bark	557,	620	Cuprohæmol	...	560
Cotton Wool	139, 232,	389	Cuprol	...	584
Couch Grass	612,	618	Cupuliferae	...	134
Coumarin	...	538	Curaçao Aloes	...	185
Counter-irritants	...	107	Curara, Curarine	...	539
Cowling's Rule for Doses	...	78	Curd Soap	...	274
Cramp Bark	...	615	Cusparia	142, 222,	375
Cranesbill	...	554	Cusso	141, 222,	375
Cream of Tartar	...	266	Cutol	...	502
Crédé's Ointment	...	516	Cyanide Gauze	...	561
Creocamp	...	562	Cyllin	...	493
Creoform	...	551	Cypridol	...	562
Creolin	...	493	Cypripedin	...	539
Creosal	...	538	Cystamine	...	613
Creosoforme	...	539	Cystogen	...	613
Creosotal	...	538	Cystopurin	...	614
Creosote Carbonate	...	538	Cytisine	...	612
„ Chamber	...	441			
„ Phosphate	...	539			
„ Salts	538,	539			
„ Tannate	...	538			
Creosotum	220,	372			
„ in Pill	...	34			
Cresalol	...	493			
Cresol	...	493			
Cresol Iodide	493,	517			
Cresol Salicylate	...	493			
Cresoli Saponatus Liq.	...	493			
Cresotic Acid	...	311			
Cresotinic Acid	...	493			
Cresylic Acid	...	493			
Cresyl	...	493			
Creta Præparata	220, 343,	373			
Crocus	135, 221,	374			
Croton Oil	134, 221,	374			

Ethol	...	611	Eriodictyon	...	543
Egg Flip	...	285	Errhines	...	108
„ Yolk of	...	429	Erythrol	...	522
„ Albumen	...	429	Erythrol Tetranitrate	...	543
Eka-iodoform	542, 551		Erythrophloëine	...	531
Elaterin and Elaterium	134, 223, 379		Erythroxylaceæ	...	134
	131, 273, 462		Escalin	...	499
Elder Flowers	...	560	Escharotics	...	108
Elecampane	...	516	Eseridine	...	438
Electrargol	...	75	Eserine Sulphate	137, 257, 437	
Electric Osmosis	...		Ether	114, 184, 314	
Electuaries, Compounding	...	18	„ Acetic	115, 185, 315	
„ of	...	148	„ Carbanilic	...	546
„ Table of	...	278	„ Chloric	55, 213	
Electuary, Lenitive	...	182	„ Formic	...	494
Elixir of Vitriol	...	61	„ Hydriodic	...	500
Elutriation	...	620	„ Hydrobromic	...	499
Embelia	...	17, 156	„ Hydrochloric	...	500
Embrocations	...	108	„ Nitrous	115, 184, 315	
Emetics	...	240, 542	„ Petroleum	...	589
Emetin	...	240, 406, 542	„ Sulphuric	...	184
Emetine	240, 406, 542		Ethyl Aminketone	...	606
Emmenagogues	...	108	„ Bromide	...	499
Emol	...	542	„ Carbamate	...	613
Emollients	...	108	„ Chloride	...	419
Emplastra, B.P.	149, 379		„ Formate	...	494
Emp. Lyttæ (Cantharides)	207		„ Iodide	...	500
Emulsion Making	...	13	„ Morphine	...	541
Endermic Medication	...	75	„ Nitritis Liquor	224, 381	
Enema, Glycerin	...	388	„ Salicylate	...	553
Enemata, Therapeutics of	328		„ Urethane	...	613
Enepidermic Medication	...	74	Ethylate of Sodium	283, 473	
Enesol	...	517	Ethylene Bromide	...	499
Enterol	...	493	„ Periodide	...	541
Eosote	...	539	Ethylenimine	...	590
Ephedrine	542, 581		Eucaïne Salts	...	544
Epicarín	...	543	Eucalembroth	...	501
Epidermic Medication	...	75	Eucalyptene Hydrochloride	...	544
Epinephrin	...	607	Eucalyptcol	...	544
Epispastics	...	107	Eucalyptol	...	545
Epsom Salt	248, 414		Eucalyptus Gum	140, 224, 382	
Equivalents, Imperial and	...	69	„ Oil	140, 224, 382	
„ Metric Systems	...	515	Eucasin	...	545
Ergoapiol	...	380	Euchinine	...	594
Ergota	135, 223, 380		Euchlorine	...	545
Ergot of Maize or Corn	...	614	Eudermol	...	583
„ of Rye	135, 223, 380		Eudoxin	524, 583	
Ergotin	223, 543		Eudrenine	...	544
Ergotine	223, 543		Euformol	...	551
Ergotinine	223, 543		Eugallol	...	497
Ergotoxine	223, 543		Eugenic Acid	...	545
Ericaceæ	...	134	Eugnoform	...	545

Glycetracts	...	557	Groups of Therapeutic Agents	...	102
Glycocholate of Sodium	...	521	Guæthol	...	557
Glycocoll	...	521	Guaiacetin	...	558
Glyco-gelatin	...	557	Guaiacol	...	557
Glycogen	...	556	„ Benzoate	...	520
„ Iodi	...	569	„ Cacodylate	...	492
Glycogenal	...	556	„ Carbonate	...	558
Glyco-Heroin	...	561	„ Salts (various)	...	558
Glyconin	...	557	Guaiacum	145, 232, 389	
Glycopasta	...	557	„ in a Mixture	...	16
Glycosal	...	557	Guaiacyl	...	558
Glycothymoline	...	611	Guaiaciform	...	559
Glycyrrhiza	137, 231, 389		Guaiamar	...	559
„ Ext. Spirituosum	...	620	Guaiaperol	559, 591	
Glymol	...	432	Guaiasanol	...	559
Goa Powder	...	193	Guacamphol	...	559
Gold Coating Pills	...	33	Guarana	...	559
Gold Salts	...	519	Guaranine	...	559
Golden Ointment	...	397	Gum Acacia or Arabic	136, 175, 296	
„ Seal	...	141	Gum Resins	...	174
Gonal	...	601	Gummi Indicum	...	620
Gonoral	...	601	Gums	...	173
Gonorrhœa Paste	...	375	Gun Cotton	...	267
Gonosan	...	601	Gunjah	...	206
Goose Grass	...	552	Gurjun Balsam	...	559
Gorit	...	529	Gutta Percha Solution	...	611
Gossypii Rad. Cort.	...	620	Guttiferae	...	135
Gossypium	139, 232, 389		Guy's Pill	...	379
Gossypium Herbaceum	...	557	Gynocardia Oleum	...	622
Goulard's Extract, Water, Lotion	...	261	Gynocardic Acid	...	532
Graminis Citrati Oleum	...	622	Gypsum	...	529
Graminaceæ	...	135			
Gramme	4, 68				
Grammatical Aids to Prescription Writing	...	90			
Granatum	140, 232, 389				
Granulation, Process of	39, 63				
Grape Sugar	230, 388, 540				
Grape Vine	...	145			
Grass, Couch	612, 618				
„ Goose or Cleaver's	...	552			
Gravimetric Analysis	...	67			
Green Hellebore	...	614			
Gregory's Powder	270, 413, 457				
Grey Oil	395, 562				
Grey Powder	...	235			
Griffith's Mixture	...	225			
Grindelia	557, 620				
Griserin	...	575			
Ground Nut Oil	...	622			

H

Habit, Influence on Dosage	78
Hæmalbumin	... 559
Hæmatics or Hæmatinics	109
Hæmatogen	... 559
Hæmoglobin	... 559
Hæmatoxylum	137, 233, 390
Hæmogallol	... 560
Hæmol	... 560
Hæmostatics	... 109
Haffkine's Prophylactics	507, 510
Hamamelidaceæ	... 135
Hamamelis	135, 233, 390
Hard Soap	274, 464
Hartshorn and Oil	... 188
Haschischin	... 530

Hashish	...	347	Horse Chestnut	...	499
Hazeline (Liq. Hamamelidis)	234, 390		Horsemint	...	136
Heart Extract	...	531	Horseradish	134, 194, 332	
Heavy Oil of Wine	...	184	Humulus	131, 246	
Hebra's Paste	...	301	Hunyadi-Janos Water	...	475
Hedonal	...	613	Hydracetic	...	503
Heim's Pill	...	379	Hydragogue Diuretics	...	108
Helalin	...	560	Hydragogues	...	106
Helcosol	...	522	Hydramyl	...	598
Helenin	...	560	Hyd. Chlor. in a Recipe	...	55
Hellebore, Black	...	560	Hydrargyri Inject. Hypo-	...	
" Green	...	614	derm.	395, 562	
Helleborein	...	560	Hydrargyrol	...	563
Helleborin	...	560	Hydrargyrum (see also	...	
Heliotropin	...	591	Mercury)	...	
Helmitol	...	614	Hydrargyrum (Official Preps.)	...	
Hemidesmus	130, 234, 391		121, 234, 392	...	
Hemisine	...	606	" (Non-Official	...	
Hemlock	144, 219, 370		Salts)	561-564	
Hemp, American Indian	...	515	" Colloidale	...	564
" Canadian	...	515	" Glycocoll	521, 563	
" Indian	131, 206, 347		Hydrastine	...	398
Henbane	143, 239		Hydrastinine	...	398
Hepar Siccum	...	555	Hydrastis	141, 238, 398	
Hermophenyl	...	562	Hydrate Theory	...	66
Heroin	...	560	Hydriodic Ether	...	500
Hetol	...	492	Hydriodol	...	562
Hetraline	...	614	Hydrobromic Acid	113, 179, 306	
Hexamethylenamine	...	613	" Ether	...	499
Hexanitrin	...	544	Hydrochinon	...	565
Hiera Picra	...	319	Hydrochloric Acid	113, 179, 306	
Hints to Dispenser	...	53	Hydrocyanic Acid	113, 180, 308	
Hip Bath	...	329	" " (Scheele)	180	
Hippo	132, 240, 406		Hydrofluoric Acid	...	495
Hirudo	234, 391		Hydrogen Peroxide	...	
" Australis	...	621	122, 238, 398, 586	...	
Hoffman's Anodyne	...	184	Hydropyrim	...	565
Holly, Brazilian	...	577	Hydroquinone	...	565
Holly-leaved Barberry	...	520	Hydroxylamine	...	565
Holocaine	...	561	Hygrophila	...	621
Holzine	...	550	Hyoscine Hydrobromide	...	
Holzinol	...	550	143, 239, 400	...	
Homalourea	...	615	Hyoscyamine Sulphate	...	
Homatropine	234, 392		143, 239, 401	...	
Homerone	...	606	Hyoscyamus	143, 239, 399	
Honey	248, 416		Hypnal	...	565
Honey Excipient	...	25	Hypnogen	...	615
Honeys, B.P.	...	159	Hypnone	...	565
Honthin	...	607	Hypnotics	...	109
Hopogan	...	576	Hypochlorite of Sodium	...	470
Hops	131, 246, 413		Hypochlorous Acid	...	345
			Hypodermic Inj., B.P.	...	155

Hypodermic Inj. of Mer-		Injections, Mercurial	... 562
cury	... 562	Inoculation	... 75
Medication	75	Inscription, in a Recipe	... 86
Hypophosphites	344, 496	" Intensive " Method	... 373
Hypophosphorous Acid and		Intestin	... 522
Syrup	... 496	Intra-arterial Injection	... 76
Hypophysis Cerebri Sicc.	555	Intra-cerebral Injection	... 76
Hyrgol	562, 564	Intra-cranial Injection	... 76
		Intra-spinal Injection	... 76
		Intra-venous Injection	... 75
I		Inula	... 560
Iatroleptic Medication	... 74	Inulin	... 195
Ibit	... 523	Iodalbumin	... 567
Ice	328, 329	Iodalbumin	... 567
Iceland Moss	... 532	Iodantipyrin	... 569
Ichthalbin	... 567	Iodates	... 496
Ichthargan	... 567	Iodglidine	... 567
Ichthoform	... 567	Iodic Acid	... 496
Ichthynate	... 565	Iodide of Ethyl	... 500
Ichthyocolla	... 565	of Potassium	... 403
Ichthyol	... 566	in Pill	35
" Resorcin	... 566	of Starch	... 504
" Salicyl	... 567	Iodine	240, 403
Idiosyncrasy	... 78	Collodion	... 537
Igazol	... 550	Colourless	... 406
Ilex	... 577	Liniment	... 240
Immunising Units	508, 512	Mollin	... 579
Imperial Weights and Mea-		Trichloride	... 567
sures	2, 68	Iodinol	... 567
Ince's Rules	... 56	Iodipin	... 567
Incineration, Process of	... 58	Iodised Phenol	... 568
Incompatibility	55, 80	Iodival	... 568
Incompatibilities, List of	81	Iodo-acetone	... 491
India Rubber	134, 208, 351	Iodo-caffeine	527, 568
Indian Addendum to B.P.	618	Iodo-caseine	... 568
" Corn	... 135	Iodocol	... 558
" Hemp	131, 206, 347	Iodocresol	... 612
" Oil of Verbena	... 622	Iodoform	123, 240, 401, 568
" Sarsaparilla	... 130	Iodoform, Odourless	... 569
" Squill	... 623	Iodoformal	... 568
" Tobacco	... 246	Iodoformin	... 569
Indigo, Wild	... 519	" Ethyl Iodide	568
Indoform	... 551	Iodoformogen	... 569
Infusa, B.P.	... 153	Iodohæmol	... 560
Infusion	... 63	Iodol	... 569
Infusions, Concentrated	54, 158	" Albuminate	... 569
Inhalation	... 75	Iodolene	... 569
Ingluvin	... 567	Iodolose	... 569
Injections, Compounding of	17	Iodopyrin	... 569
" Hypodermic,		Iodoterpine	... 569
B.P.	... 155	Iodo-theobromine	568, 610
" Medication by	75	Iodothyrim	... 570

Iodum	123, 240, 403
Iodyloform	... 570
Iohydrin	... 570
Iothion	... 570
Ipecacuanha	132, 240, 406
" Deemetinised	407
Iridaceæ	... 135
Iridin	... 570
Iris	... 570
Iron Alum	... 502
Iron (see also Ferrum)	225, 383
" Alginoid	... 548
" Antidote	... 628
" Dialysed	... 548
" Monse's Salt	... 548
" Non-Official Salts	... 547
" Quevenne's	... 228
" Somatose	549, 602
" Vitellin	... 549
Isinglass	... 565
" Japanese	... 500
Isobutyl Amyl	... 323
Isoform	... 570
Ispaghula	... 621
Itrol	... 570
Ivy, Poison	... 598
Izal	... 571

J

Jaborandi	142, 241, 408
Jacaranda Lancifoliata	... 571
Jalap	133, 242, 409
" Group of Purgatives	107
" Tinct. Co.	... 621
Jamaica Dogwood	... 591
" Sarsaparilla	... 275
Jambul	... 571
James' Powder	192, 326
Jarisch's Ointment	... 497
Jasmine, Yellow	... 139
Jequiritol	... 571
Jequirity Seeds	... 571
Jeyes' Fluid	... 493
Jodipin	... 567
Jordan Almonds	142, 190
Jothion	... 570
Juglans Cinerea	... 571
Juices, B.P.	... 165
Jumble Beads	... 571
Juniper Tar Oil	... 202
Juniperus	133, 243, 410

K

Kaladana (and Resin)	... 621
Kaolin	25, 243, 410, 542
Kaposi's Ointment	... 420
Kavæ Rhizoma	... 621
Kava Kava	... 572
Kefir	... 573
Kelene	... 500
Kelvolin	... 493
Keratin	33, 572
Keratin Coating of Pills	33
Kermes Mineral (Antimon. Sulphuratum)	... 192
Kidney Substance	... 556
Kieselguhr	25, 542
Kineurine	... 594
Kino	137, 243, 410
" Bengal	... 619
" Botany Bay	... 621
" Eucalypti	... 621
Klein's Prophylactic	... 510
Knob Root	... 536
Koch's Tuberculin	... 513
Koji	... 607
Kola	... 572
Kolle's Vaccine	... 508
Kombé	... 139
Kosotoxin	... 222
Koumiss	... 572
Kouso	141, 222, 375
Krameria	140, 141, 243, 410
Kresolum	... 493
Kryofin	... 572

L

Labelling	... 15
Labiata	... 136
Lactannin	... 523
Lacteol	... 572
Lactic Acid	113, 180, 309
Lactobacilline	... 572
Lactone of Canthar. Acid	530
Lactol	... 520
Lactophenin	... 574
Lactophosphates	... 345
Lactose	... 272
Lactoserve	... 572
Lactosin	... 456
Lactyl-phenetidin	... 574
Ladies' Slipper	... 539

Lævulose	...	574	Linacææ	...	138
Lamellæ, B.P.	...	156	Linctus or Lincture	...	18
Lanoline	184, 313		Linimenta, B.P.	...	156
Lard	183, 313		Liniments, Dispensing of	...	17
Largin	...	574	Linimentum Exsiccans	...	553
Lassar's Paste	...	603	Linum (Linseed)	138, 245, 411	
Latin Words and Phrases	93		Liquefaction	...	62
Laudanum	...	255	Liquidambaracææ	...	138
Lauracææ	...	136	Liquor Carbonis Detergens	441	
Laurel, Cherry	...	142	Liquores, B.P.	...	157
„ Spurge	...	144	Liquorice	137, 231, 389	
Laurocerasi Folia	142, 244, 410		Liquorice Excipient	...	25
Lavandula	136, 244, 411		Litharge	...	261
Lavender	136, 244		„ Plaster	...	262
Laxatives	...	106	Lithion	...	575
Laxatol, Laxen or Laxoin	589		Lithio-Piperazine	...	591
Lead (Official)	124, 260, 441		Lithium (Official Preps.)	123, 246, 412	
Lead, Sugar of	124, 260		„ (Non-Official)	...	575
„ White	...	261	Lithium-Diuretin	...	610
Leaves, Gathering and			„ Quinate	...	497
Drying of	61, 63		„ Symphorol	527, 575	
Lecithin	...	574	„ Sulpho-ichthyolate	566	
Lecitogen	...	574	Lithontriptics	105, 412	
Leech Extract	392, 556		Litmus	...	138
Leeches	234, 391		Litre	4, 68	
„ Australian	...	621	Liver of Sulphur	...	263
Leek	...	501	Liver Substance (dried)	...	555
Leguminosæ	...	136	Lixiviation	...	64
Lemon Grass Oil	...	622	Lobelia	138, 246, 412	
Lemon Juice	245, 305		Lobeliacææ	...	138
Lemon	131, 245, 305, 411		Loch, Compounding of	...	18
Lemonade, Purgative	...	576	Loganiacææ	...	139
Lenigallol	...	497	Logwood	137, 233, 390	
Lenirobin	...	547	Long's, St. John, Liniment	290	
Lenitive Electuary	...	278	Loretin	568, 575	
Leprolin	...	510	Losophan	...	493
Leprosy Serum	...	510	Lotiones, B.P.	...	158
Leptandra	...	574	Lotions, Compounding of	17	
Leptandrin	...	574	Lozenges, B.P.	...	170
Levigation	...	64	„ Bases for	...	170
Levurine	...	584	Lugol's Solution	...	403
Lichenes	...	138	Lumbar Puncture	...	76
Liebreich's Ointment Basis	579		Lunar Caustic	...	194
Lien Siccus	...	556	Lung Substance (dried)	...	554
Lignum Vitæ	145, 232		Lupulus	131, 246, 413	
Ligroin	...	589	Lycetol	...	591
Liliacææ	...	138	Lycoperdon Giganteum	...	575
Lily of the Valley	...	537	Lycopodium Clavatum	...	576
Lime	203, 343		Lysargin	...	516
„ Slaked	...	204	Lysidine	...	591
Lime Water	204, 303		Lysiform	551, 576	
Limonium	131, 245, 305, 411				

Lysol	493, 576	Meadow Anemone	... 592
Lysulfol	... 493	Meadow Saffron	... 139
M		Measuring	... 4
		Measures and Weights	2, 3, 68, 83
Maceration	... 64	„ Domestic	... 84
Macfadyen's Sera	507, 515	„ Graduated	... 4
Madeira Wine	... 317	Medulla Ossium Rubra	... 556
Magenta	... 551	Medullin	... 525
Magistral Preparations	... 146	Mel	248, 416
Magnesia	123, 247, 413	Melanthaceæ	... 139
„ Fluid	248, 413	Mella, B.P.	... 159
„ Granular Citrate	... 473	Melon Pumpkin Seeds	... 620
„ of	... 473	Melting	... 62
„ in Mixture	... 12	Menispermaceæ	... 139
„ in a Recipe	... 54	Menstruum	... 64
Magnesium Cacodylate	... 492	Menthæ Pip. Ol.	136, 249, 416
„ and Iron Sulph.	549	„ Virid. Ol.	136, 249, 416
„ Non-Official	576	Menthol	136, 249, 416
„ Peroxide	... 586	Menthol-Iodol	... 569
„ Ricinoleate	... 598	Menthol Valerianate	... 524
„ Sulphate	123, 248, 414	Mentholeate	... 577
„ Trichlorphenate	498	Menthophenol	... 577
Magnoliaceæ	... 139	Menthosol	577, 588
Maize	135, 190	Menthoxol	... 578
Malachite Green	... 577	Mercuramine	... 564
Malakin	... 574	Mercurial Cream	... 562
Male Fern	135, 228, 385	Mercuriol	... 563
„ Ext. of (in Mixt.)	17	Mercuro-iodised-hæmol	... 560
Mallein	... 509	Mercuriol	563, 584
Malonal	... 615	Mercury (see also Hydrar-	
Malourea	... 615	gyrum)	
Malt, Extracts of	... 577	„ Cacodylate	... 492
Malvaceæ	... 139	„ Hypoderm. Inject.	395, 562
Mammary Gland Substance	554	„ Mollin	... 580
Mandrake	... 262	„ (Non-Official Salts)	561
Manganese	... 415	„ (Official Preps.)	121, 234, 392
„ and Iron Citrate	549	„ Phenol	... 561
Mannitol Hexanitrate	... 544	„ Salicyl-Arsenate	517
Maragliano's Serum	... 513	Mescal Buttons	... 504
Marc	... 64	Mesenteric Gland Sub-	
Margosa Bark	... 619	stance	... 554
Maricol	577, 598	Mesotan	... 552
Marienbad Salt	474, 531	Metakalin	... 493
Marmorek's Serum	... 513	Metasol	... 566
Marrow, Bone	... 556	Methanal	... 550
Marrubin	... 556	Methyl Acetyl Salicylate	553
Marshmallow Root	25, 501	„ Aldehyde	... 550
Maté	... 577	„ Atropine Nitrate	545
May Apple	131, 141, 262	„ Chloride	... 578
Mazzoni's Solution	... 569		

Methyl Green	577, 578	Mother Liquor	... 59
„ Rosaniline	... 578	Mucilage Excipient	... 24
„ Salicylate	... 552	Mucilagines, B.P.	... 160
„ Violet	... 578	Mucin	... 580
Methylacetanilide	... 547	Mucogène	... 592
Methylal	... 578	Mudar	... 619
Methylene	... 579	Mullein Plant	... 615
Methylene Blue	... 579	Muscarine	... 580
Methysal Balm	... 552	Musk	251, 419
Metramine	... 613	Musk Root (Sumbul)	... 288
Metric Weights and Measures	3, 68	Mustard	133, 280, 468
Mezereum	144, 250, 417	„ Bath	... 469
Microcidine	... 582	„ Pack	... 330
Migralgine	... 527	„ Paper	147, 280
Migranine	... 528	„ Plaster	... 469
Mil	... 4, 73	„ Poultice	... 469
Milk of Sulphur	... 287	Mydrasine	546, 581
„ Somatose	... 602	Mydriatics	... 109
„ Sugar	272, 461	Mydrine	543, 581
Mindererus Spirit	... 320	Myelin	... 525
Mineral Acids	179, 180, 181, 306, 312	Myelocene	... 556
Minim	8, 85	Mylabris	... 621
Mist. Alb.	... 415	Myotics	... 110
„ Cretæ (Conc.)	... 54	Myrciæ Spiritus	... 519
„ Ferri Co. (Conc.)	... 54	Myristica	140, 251, 419
Mistletoe	... 579	Myristicaceæ	... 140
Misturæ, B.P.	... 159	Myrrha	130, 252, 419
Mixture, Basham's	... 385	Myrrh in Mixture	... 17
„ Griffith's	... 225	Myrobalanum	... 621
„ Scudamore's	... 369	Myrtaceæ	... 140
„ White	... 415	Myrtol	... 581
Mixtures, B.P.	... 159		
„ Compounding of	8	N	
Model Prescription	... 86	Naftalan	... 581
Mollin	... 579	Naphtha	... 589
Monkshood	... 141	Naphthalan	... 581
Monobromated Camphor	530	Naphthaline or Naphthalene	... 581
Monochlorophenol	580, 587	Naphthalol	... 521
Monol	... 529	Naphthamine	... 613
Monsel's Salt of Iron	... 548	Naphthol (Alpha or Ortho)	582
Monsonia Ovata	... 580	Naphthol (Beta) (see also Beta)	252, 420
Moraceæ	... 139	Naphthol-aristol	... 582
Moro's Tuberculin Ointment	... 514	Naphthol-Camphor	529, 582
Morphine	250, 253, 425	Naphthol-Salicylate	... 521
Morrhua Ol.	251, 417	Naphthosalol	... 521
Morrhual	... 580	Naphthoxol	... 578
Mortar, How to Use	11, 18, 26, 27	Narceine	... 582
Moschus	251, 419	Narcotics	... 110
		„ Action of	... 315

Narcotile	...	500	Oil of Cade	133, 202, 341
Narcotine	253, 582		„ of Turpentine	... 133
Narcyl	...	582	„ Vaseline	... 432
Nargol	...	584	„ of Wine, Heavy	... 184
Nasrol	...	527	Oils, B.P.	... 160
Nastin	...	510	„ Fixed and Volatile	160
Natural Orders	...	130	Ointments, B.P.	... 171
Nauheim Bath	...	330	„ Compounding of	42
Nauseating Expectorants	109		Olea, B.P.	... 160
Neem Bark	...	619	Oleaceæ	... 140
Neoforn	...	522	Oleates	236, 310, 424, 489
Nervanin	...	583	Oleic Acid	113, 180, 310
Nervines	...	110	Oleocresote	... 538
Neurodin	...	583	Oleogens	... 589
Neuronal	...	503	Oleo-Resins	... 174
Neutral Principles	...	173	Olive Oil	140, 253, 424
“ New Skin ”	...	532	Oliveri Cortex	... 622
Nicotine	...	583	Onion, Spanish	... 478
Niemeyer's Pill	...	379	Ophthalmic Reaction (Tu-	
Nitre	265, 453		bercle)	... 514
„ Spirits of	...	184	Ophthalmic Reaction (Ty-	
Nitric Acid	113, 180, 306		phoid)	... 515
Nitrite of Amyl	116, 190, 323		Opium	253, 425
Nitrites	...	323	„ Poisoning by	425, 632
Nitro-Erythrite	...	543	Opocerebrin	... 525
Nitroglycerin	291, 485		Opodeldoc	... 274
Nitro-Hydrochloric Acid	113, 180, 310		Opticine	... 556
Nitrous Ether	184, 315		Orange Peel and Flowers	
Nitrous Oxide	...	583		131, 196, 336
Nizin	...	617	Orange Wine	... 197
Nomenclature, Unofficial	54		Orchidin	... 604
Non-Official Remedies	490-617		Orchitin	... 604
Normal Saline Solution	...	472	Orexine	... 585
Nosophen	568, 583		Organotherapy	
„ Salts	...	524		290, 483, 525, 531, 554, 603,
Novaspirin	...	519		606
Novocain	...	583	Orphol	... 522
Nuclein or Nucleol	...	584	Orthoform	... 585
Nutmeg	140, 251, 419		Ortho-Monobromphenol	588
Nutrose	532, 601		Ortho-Naphthol	... 582
Nux Vomica	139, 252, 420		Osmic Acid	... 496
			Osmosis, Electric	... 75
			Otto of Rose	271, 460
			Ouabaid	... 585
			Ouabain	... 585
			Ounce, Oz.	2, 68, 84
			Ovarian Substance	... 554
			Ovi Albumen	... 429
			Ovi Vitellus	... 429
			Ovoferriin	... 549
			Ovogal	... 521
			Ovolecithin	... 574

O

Odolol	...	584
Official Pharmacy	...	57
Oil, Adepsine	...	432
„ Dee	...	432
„ Grey	395, 562	
„ of Bitter Almonds	...	190

Ox Bile	225, 382	Paregoric, or P. Elixir	206, 255
„ Serum	... 560	„ Scotch	... 255
Oxaphor	... 530	Pareira	139, 256, 432
Oxycamphor	... 530	„ (False)	... 620
Oxychinaseptol	... 518	Parenchymatous Injection	75
Oxygen	... 586	Parenols and Parogens	... 589
Oxymel	249, 416	Paroleine	... 432
„ Scillæ	249, 276	Parotid Substance	... 555
Oxysparteine	... 603	Parrish's Syrup	344, 385
Oxytocics	... 110	Parsley	... 515
Ozokerine	... 589	Paste, Chili	208, 351
Ozone	... 586	„ Copaiba or Cubeb	375
Ozonic Ether	399, 586	„ Lassar's	... 603
Ozonised Air	... 586	„ Proctor's	... 26
		„ Vienna	... 447
		„ Ward's	... 259
P		Pea-nut Oil	... 622
Packs (various)	... 330	Pearl Coating	... 31
Pagenstecher's Ointment		„ White	... 522
	236, 397	Pearson's Antiseptic	... 493
Panama Bark	142, 268	Pearson's Solution	... 177
Pancreatin	... 430	Pelletierine	232, 389, 588
Pancreatis Liquor	255, 429	Pellitory	132, 267
Pancreon	... 430	Pelosine	... 257
Pangaduine	... 580	Pentyl Hydride	520, 598
Pansy	... 616	Pentylene	... 598
Papain	433, 587	Pepper, Black	140, 259, 439
Papaver	140, 256, 431	„ Cayenne	... 208
Papaveraceæ	... 140	Peppermint	136, 249, 416
Papaverine	253, 428	„ Camphor	... 249
Papaw Juice	... 587	Pepsin	257, 430, 433
Papayotin	... 587	Peptonisation of Food	... 430
Paper, Mustard	147, 280	Percolation	... 64
Papine	... 587	Peritoneal Medication	... 76
Para-acet-phenetidin	... 257	Perlsucht Tuberculin	
Para-Bismuth	... 524	Residuum	... 514
Parachlorsalol	... 588	Permanganate of Calcium	529
Paracoto Bark	... 538	Permanganate of Potas-	
Paracotoin	... 538	sium	126, 265, 454
Paracresotic Acid	... 493	Permanganate of Potas-	
Paraffin Ointment	... 256	sium in Pills	... 35
Paraffinum Dur.	256, 431	Peronine	... 588
„ Liquidum	256, 431, 589	Perosmic Acid	... 496
„ Molle	256, 431, 589	Peroxide of Hydrogen	238, 398
Paraform	... 587	„ of Sodium	... 399
Paraformic Aldehyde	... 587	Peru Balsam	137, 197, 336
Paraldehyde	123, 256, 432	Peruol	... 588
Para-Monochlorphenol	580, 587	Peruscabine	... 588
Paranephrin	... 606	Peruvian Bark (Cinchona)	214
Para Rubber	... 208	Pessaries, Compounding of	46
Paratoxin	... 521	Petit's Liquor	... 557
		Petrol	... 520

Petrolatum	...	589
Petroleum	...	588
" Benzene or Ben-		
zine	...	519
" Ether	...	588
" Spirit	...	519
Pharbitis and Pharbitisin		621
Pharmaceutical Incompati-		
bility	...	80
Pharmacological Action	...	102
Pharmacopœial Preparations		146
" Weights and		
Measures		68
Pharmacy, Extemporaneous		1
" Official	...	57
Phenacetin	123, 257,	433
Phenalgine	...	503
Phenazone	257,	434
Phenocoll	...	589
Phenol	112, 178,	303
" Bismuth	...	522
" Camphor	...	529
" Iodised	...	568
Phenolphthalein	...	589
Phenosol	...	574
Phenosalyl	...	574
Phenyl-Acetamide	...	175
Phenyl-Formamide	...	551
Phenyl-Urethane	...	546
Phesin	590,	593
Phloridzin	...	590
Phlosote	...	539
Phosphorated Oil	...	258
Phosphoric Acid		
114, 181,	310,	437
Phosphorus	124, 257,	435
" in Pill	...	35
Phosphotal	...	539
Photoxylin	...	532
Physiological Action	...	102
Physostigma and Physo-		
stigmine	137, 257,	437
Phytin	...	495
Phytolacca Decandra	...	590
Phytolaccin	...	590
Pichi	...	590
Picrate of Ammonia	...	496
Picratol	...	516
Picric Acid	...	496
Picrorrhiza	...	622
Picrotoxin	139, 257,	438
Pilewort	...	533

PILL—		
Baly's	...	379
Blaud's	227,	385
Blue	...	235
Sir A. Clark's	...	318
Excipients	...	24
Finisher	...	28
Guy's	...	379
Heim's	...	379
Machines	28,	30
Mortar	...	26
Niemeyer's	...	379
Plummer's	...	238
Rufus	...	186
Slab or Tile	...	29
Pill-bearing Spurge	...	546
Pills, B.P.	...	161
" Compounding of	...	24
" Coating of	...	30
" Gilding of	...	33
" Silvering of	...	32
" Size of	...	24
" in Powder	...	53
Pilocarpine Nitrate		
142, 259,	408	
" Phenas	...	591
" Salicylas	...	591
Pilulæ, B.P.	...	161
Pimenta	140, 258,	439
Pineal Gland Substance	...	555
Pines (Various)	...	133
Pini Oleum	133, 259,	439
Pint	68,	84
Pinus Pumilio	133, 259,	439
Piperacæ	...	140
Piperazine	...	590
" Lithium	...	575
" Quinate	...	497
Piperidine	...	591
Piperine	...	591
Piper Methysticum	...	572
Piper Nigrum	140, 259,	439
Piperonal	...	591
Pipsissewa	...	533
Pirquet's Reaction	...	514
Piscidia Erythrina	...	591
Pitch Burgundy	133, 259,	440
Pituitary Gland Substance	...	555
Pix Burgundica	133, 259,	440
" Carbonis Præparata	260,	441
" Liquida	260,	440

- | | | | | |
|---------------------------|--------------------|-----|---------------------------|--------------------|
| Placental Substance | ... | 555 | Powder, Dover's | 214, 254, 407, 429 |
| Placentine | ... | 555 | " Gregory's | 270, 413, 457 |
| Plants, Gathering of | ... | 63 | " Grey | ... 235 |
| " Drying of | ... | 60 | " in Mixtures | ... 11 |
| Plasmon | 532, 545 | | " James's | 192, 326 |
| Plaster of Paris | ... | 529 | Powders, B.P. | ... 163 |
| Plasters, B.P. | ... | 149 | " Seidlitz | ... 281 |
| " Spreading of | ... | 49 | " to Fold | ... 20 |
| " Therapeutics of | ... | 379 | Prayer Beads | ... 571 |
| Plumbum (Official Salts) | | | Precipitate, Red | ... 237 |
| | 124, 260, 441 | | " White | ... 238 |
| Plummer's Pill | ... | 238 | Precipitated Chalk | 203, 343 |
| Pneumin | ... | 538 | " Sulphur | ... 287 |
| Pneumococcine | 569, 608 | | Precipitation | ... 66 |
| Podophylli Indici Res. et | | | Prepared Chalk | 220, 343, 373 |
| Rad. | 622, 623 | | " Coal Tar | ... 260 |
| Podophyllin | 262, 444 | | Prescription, Analysis of | 86 |
| Podophyllum | | | " Autograph | 100 |
| | 131, 141, 262, 444 | | " Model of | 87 |
| Poison Ivy or Oak | ... | 598 | " Parsing of | 88 |
| Poisons, Index of | ... | 625 | " Specimen of | 100 |
| Poisonous Doses | ... | 56 | " Writing | 86 |
| Poke Plant | ... | 590 | PREScriptions FOR— | |
| Pollantin | ... | 509 | Alcoholism | ... 352 |
| Polygalaceæ | ... | 140 | An Alterative | 301, 384, 453 |
| Polygonaceæ | ... | 141 | An Anthelmintic | ... 386 |
| Polymeriform | ... | 587 | An Antispasmodic | ... 413 |
| Polyvalent Sera | 507, 511 | | An Anodyne | 371, 441 |
| Pomegranate | 140, 232, 389 | | An Astringent | 443, 488 |
| Poor Man's Bath | ... | 330 | A Bitter Tonic | 345, 423, 456 |
| Poppy Capsules | 140, 256, 431 | | Bronchitis | 407, 467 |
| " Petals, Red | 140, 271 | | Chalybeate | ... 385 |
| Populin | ... | 520 | Constipation | ... 424 |
| Porter | ... | 317 | Croup | ... 326 |
| Port Wine | ... | 317 | Cystitis | ... 400 |
| Posology | ... | 76 | A Diaphoretic | 315, 450 |
| Potassa Sulphurata | | | Diarrhœa | 354, 374, 390 |
| | 263, 448, 480 | | A Diuretic | ... 466 |
| Potassium (Official) | | | Dyspepsia | ... 307 |
| | 124, 263, 338, 446 | | Eczema | ... 441 |
| " Alum | ... | 187 | An Effervescing Mixture | |
| " Cantharidinate | | | | 305, 472 |
| | 348, 530 | | An Emetic | ... 466 |
| " Cobalto-Nitrite | ... | 535 | Epilepsy | ... 340 |
| " Iodide | ... | 403 | Gonorrhœa | 372, 375 |
| " Iodide, in Pill | ... | 35 | Gout | ... 369 |
| " Permanganate, | | | Hair Restorer | ... 460 |
| in Pill | ... | 35 | Hæmorrhoids | 371, 440 |
| " Silicate | ... | 602 | An Hypnotic | 429, 432 |
| Poultices | 411, 469 | | Incontinence of Urine | 335 |
| Powder, Bleaching | ... | 204 | A Laxative | 354, 450 |
| " Compounding of | ... | 18 | | |

PRESCRIPTIONS FOR—

Migraine	342, 348
Mouth Wash	... 410
Night Sweating	... 488
A Purgative	370, 446, 458, 465
Rheumatism, Chronic	390
A Stomachic	... 458
Throat Paint	... 319
Throat Spray	... 303
A Tonic	301, 354, 365, 379, 384, 388
Vomiting	... 309
Proctor's Paste	... 26
Proponal	... 615
Prosecretin	... 554
Prostate Gland Substance	555
Protargol	... 592
Protectives	... 108
Proteol	... 551
Prunin	... 532
Prunum	142, 267, 455
Prunus Virginiana	142, 266, 455
Prussic Acid	180, 308
" " (Scheele's)	180
Psychotrine	... 240
Pterocarpi Lignum	138, 267, 455
Ptychotis Oil	... 622
Puff Ball	... 575
Pulmones Sicca	... 554
Pulping, Process of	... 66
Pulsatilla	... 592
Pulsatilla Camphor	... 592
Pulveres, B.P.	... 163
Pulverisation	... 65
Pulvis Aromaticus	... 215
Pumilio Pine	... 133
Punicine	232, 588
Purgatin	590, 592
Purgative Lemonade	... 576
Purgative Oils	... 107
Purgatives	... 106
Purgatol	... 592
Purgen	... 589
Purging Agaric	... 500
Pyocyanase	... 592
Pyocyanus-Protein	... 592
Pyoktanin	... 578
Pyradoxin	... 497
Pyramidon	... 592
Pyranum	... 520

Pyrantin	... 593
Pyrenol	... 520
Pyrethri Radix	132, 267, 455
Pyridine	... 593
Pyrocatechin	... 243
Pyrodin	... 593
Pyrogallic Acid	... 497
Pyrogallol	... 497
" Bismuth	... 522
Pyroxylin	267, 456, 532

Q

Qualitative Analysis	... 67
Quantitative "	... 67
Quassia	143, 267, 456
Quebrachine	... 518
Queen's Root	... 604
Quercus	... 134
Quevenne's Iron	... 228
Quillaia	14, 142, 268, 456
Quinaphthol	... 593
Quinetum	... 593
Quinic Acid	... 497
Quinidine	534, 594
Quinine, in a Mixture	... 15
" Arrhenalate	... 517
" Fluoride	... 495
" Phytin	... 495
" in Pills	... 35
" Salts (Official)	132, 268, 596
(Non-Official)	... 594
Quinoform	... 551
Quinol	... 565
Quinoline and Bism. Sul-	
phocyanide	... 524
Quinoidin	... 594
Quinosol	... 533
Quinotropine	497, 614

R

R	... 86
Rachitol	... 606
Radium	... 596
Ragwort	... 602
Raisins	... 145
Ranunculaceæ	... 141
Reactions, Chemical	... 112
Rectified Spirit	... 284
Red Bone Marrow	... 556

- Red Chromate of Potassium 263
 „ Cinchona Bark ... 214
 „ Gum 140, 224
 „ Lotion ... 488
 „ Pepper (Capsicum) ... 208
 „ Poppy Petals ... 271
 „ Precipitate ... 237
 „ Sandal or Sanders
 Wood 138, 267
 Reduced Iron ... 228
 Refrigerant Diuretics ... 108
 Refrigerants ... 110
 Regulin ... 500
 Remijia ... 132
 Renaglandin ... 606
 Renes Sicca ... 556
 Rennin ... 429
 Renostyptin ... 606
 Resaldol ... 596
 Resina 133, 269, 456
 Resinol ... 598
 Resins ... 173
 Resins in Mixture ... 16
 Resolvents ... 110
 Resorcin ... 596
 Resorcinol 596, 597
 Resorcin-phthalein ... 597
 Restoratives ... 110
 Retinal Extract ... 556
 Retinol ... 598
 Revulsives ... 107
 Rhamnaceæ ... 141
 Rhamnus Purshianus ... 210
 Rhatany 140, 141, 243
 Rhei Radix 141, 269, 457
 Rheumatin ... 595
 Rhigolene 589, 597
 Rhodallin ... 550
 Rhœados Petala 140, 271, 458
 Rhubarb Root 141, 269, 457
 „ in Pill ... 35
 Rhus Aromatica ... 598
 „ Toxicodendron ... 598
 Rice 135, 190
 Richardson's Colloid ... 536
 Ricin 271, 458, 598
 Ricini Oleum 134, 271, 458
 Ricinoleic Acid 271, 458
 Ringer's Law 103, 307, 446
 Risicol ... 577
 Rochelle Salt 280, 470
 Rock Oil ... 588
 Rodagen ... 513
 Roots, in a Prescription 55
 „ Gathering of ... 63
 „ Drying of ... 60
 Rorig's Glycogen ... 556
 Rosaceæ ... 141
 Rosæ, Aqua, Oleum 142, 271, 460
 „ Petala 142, 272, 460
 Rosaniline ... 551
 „ Triphenyl ... 579
 Roseine ... 551
 Rosemary 136, 272, 460
 Rosenol ... 599
 Rosinol ... 598
 Rosmarini Oleum 136, 272, 460
 Rubefacients ... 107
 Rubber Glove Substitute 532
 Rubiaceæ ... 132
 Rubidium Salts 527, 599
 Rubinat Water ... 475
 Rubine ... 551
 Rubini's Camphor Solution 347
 Rufus' Pill ... 186
 Rum ... 317
 Rumicin ... 599
 Russian Bath ... 329
 Rutaceæ ... 142
 Rye ... 135

 S
 Saccharin 231, 388
 „ Soluble ... 231
 Saccharum 272, 461
 „ Lactis 272, 461
 Sacred Bark ... 210
 Safrol ... 599
 Saffron 135, 221, 374
 „ Meadow ... 139
 St. Germain's Tea ... 468
 St. John's Liniment ... 290
 Sajodin ... 528
 Salacetin ... 518
 Salacetol ... 599
 Sal Acetosella ... 599
 Sal Alembroth 501, 562
 Sal Ammoniac ... 188
 Sal Carolinum ... 531
 Sal Volatile ... 189
 Salbromalid ... 599
 Saletin ... 518

Salicaceæ	...	142	Sanoform	...	600
Salicinum	142, 273,	310	Sanose	...	601
Salicyl-acetol	...	599	Santalaceæ	...	142
Salicylamide	...	599	Santali Oleum	142, 273,	462
Salicylate and Quinine (in Mixture)	...	16	Santalol	273,	601
Salicylbromanilid	...	599	Santonica	...	132
Salicylic Acid	114, 181,	310	Santoninum	273,	462
" Alcohol	...	600	Santoninoxim	...	601
" Colloid or Collodion	...	536	Santyl	...	601
Saliformin	...	551	Sapo Animalis, Durus, and Mollis	274,	462
Saligallol	...	497	Sapolan	...	589
Saligenin	...	600	Saponin	...	456
Salinaphthol	...	521	Sapotoxins	...	456
Saline Solution, Normal	...	473	Sappan	...	623
Salipyrin	...	593	Sarsæ Radix	143, 275,	464
Salit	...	503	Sarsaparilla	143, 275,	464
Salix Nigra	...	600	" Indian	...	130
Salocoll	...	589	Sassafras	136, 275,	465
Salol	126, 273,	461	" Black	...	622
Salol Camphor	...	462	" Oil	...	599
" Coating for pills	...	33	Sassy Bark	...	531
" Collodion	462,	537	Sauerin	...	572
Salophen	...	462	Saw Palmetto	...	601
Saloquinine	...	595	Scale Preparations	...	228
Salt, Carlsbad	474,	531	Scale Preps. (in Mixt.)	...	16
" Common	282,	472	Scammony	133, 275,	465
" Epsom	248,	414	Scheele's Prussic Acid	...	180
" Everett's	...	113	Schleich's Mixtures	360,	367
" Glauber's	284,	474	Scilla	138, 276,	465
" Marienbad	474,	531	Scillain, Scillipicrin, Scilli-		
" Rochelle	284,	470	toxin	276,	466
" of Sorrel	...	599	Scitaminaceæ	...	145
" of Tartar	...	264	Sclavo's Serum	...	506
Saltpetre	...	265	Sclerotic Acid	...	498
Salud	...	571	Scoparin	...	603
Salufer	495,	602	Scoparium	137, 277,	466
Salumin	...	600	Scopola Carniolica	...	601
Salve Soap	...	580	Scopolamine Hydrobro-		
Sal Volatile	...	189	mide	...	239
Sambuci Flores	131, 273,	462	Scotch Paregoric	...	255
Sanatogen	495,	545	Scott's Ointment	235,	397
Sand Bath	...	62	Scrophulariaceæ	...	142
Sandal Wood, Oil of	273,	601	Scruple	2, 68,	84
Sandal Wood, Red	138,	267	Scudamore's Mixture	...	369
" " White	...	142	Sea-Wrack	...	551
Sanguinaria Canadensis	...	600	Secalin	...	612
Sanguinarin	...	600	Secretin	...	554
Sanguinarine	...	600	Sedatives	...	110
Sanguisugæ Ext. Sic.	...	556	Seidlitz Powder	...	281
Sanitas	...	399	Senecio	...	602
Sanmetto	...	601	Senega	141, 277,	467

Senna	137, 277, 467	Silver Trinitrophenol	... 516
Serpentaria	130, 279, 468	Simaba Cedron	... 532
Serum (Ox)	... 560	Simarubaceæ	... 143
Serum, Anthrax	... 506	Simpson's Poor Man's Bath	330
„ Anticancer	... 507	Sinapis	133, 280, 468
„ Anticerebro-spinal		Sinapism, to make	... 469
„ Fever	... 507	Sitz Bath	... 329
„ Anticholera	... 507	Slaked Lime	... 204
„ Anticolon Bacillus	508	Smilacæ	... 143
„ Antidiphtheria	... 508	Snake Root, Australian	... 546
„ Antidysentery	... 509	„ Black (Cimici-	
„ Antigonorrhœa	... 509	„ fuga)	... 141
„ Anti-Hay Fever	... 509	„ Senega	... 141
„ Antileprosy	... 510	„ (Serpentary)	
„ Anti-Malta Fever	510		130, 468
„ Antimeningococcic	507	Snake-venom Antitoxin	... 515
„ Antiplague	... 510	Snow-Ball Tree	... 615
„ Antipneumococcic	510	Snow, Carbonic	... 531
„ Antistreptococcic	511	Soamin	... 518
„ Antitetanus	... 512	Soap, Curd, Castile, Hard	
„ Antithyroid	... 512		274, 464
„ Antitoxic	... 505	Soap Bark	268, 456
„ Antituberculosis	513	„ Excipient	... 25
„ Antityphoid	... 514	„ Soft	... 274
„ Antivenom	... 515	Socotrine Aloes	138, 185, 317
Serumtherapy	... 505	Soda (Preps.)	126, 280, 470
„ Polyvalent		Sodii Arsenas	177, 281
	507, 511	Sodio-benzoate of Caffeine	527
Sesami Oleum	... 622	Sodio-Salicylate of Caffeine	527
Sevum Præparatum	279, 468	Sodium Preparations (Offic.)	
Shape for Blisters and Plasters	47		126, 280, 470
Sherry Wine	292, 317	„ Biborate	... 201
Shower Bath	... 330	„ Cacodylate	... 491
Sialagogues	... 110	„ Caffeine Iodide	527, 568
Sicco	... 560	„ Caseinate	... 532
Sidonal	... 497	„ Coumarate	... 538
„ New	... 498	„ Dithiosalicylate	541
Sifting	... 66	„ Eugenol Carbinol	
„ Small Quantities	19		545, 527
Signature of a Recipe	... 86	„ Fluorescin	... 597
Silico Fluorides	... 602	„ Formate	... 494
Silicon	... 602	„ Glycocholate	... 521
Silk, Corn	... 616	„ Hypochlorite	... 470
Silver (see also Argenti)		„ Iodate	... 496
„ Casein	... 516	„ Iodide	128, 403
„ Coating for Pills	... 32	„ Oleate	425, 546
„ Colloid	... 516	„ Peroxide	... 399
„ Gelatose	... 501	„ Pyroborate	... 201
„ Glutin	... 501	„ Pyrocatechin	
„ Protein	517, 592	„ Acetate	... 558
„ Salts (Official)		„ Silicate	... 602
	117, 194, 331	„ Sulpho-ichthyolate	566

Sodium Sulphoricinate ...	598	Spoonful ...	84
„ Symphorol ...	527	Sprays, Dispensing of ...	17
„ Sozoiodol ...	602	Spruce ...	133
„ Taurocholate ...	521	Spud ...	29
„ Theobromine Salts ...	609	Spurge Laurel ...	144
Solanaceæ ...	143	Spurge, Pill-bearing ...	546
Solubilis ...	549	Squaw Root ...	532
Soluro ...	584	Squill (Indian) ...	623
Solution ...	66	Squill ...	138, 276, 465
Solutions, B.P. ...	157	Squirting Cucumber ...	134
Solutions for Dispensing ...	53	Standardisation ...	67
Solutol ...	493	Staphisagria ...	141, 285, 475
Solveol ...	493	Star Anise ...	139, 191
Solvosal Lithia ...	575	Starch ...	135, 190, 324
Somatose ...	602	„ Bromide ...	504
„ Iron ...	549	„ Chloride ...	504
Somnal ...	602	„ Iodide ...	504
Somnoform ...	500	Starch Paste Iodide ...	504
Somnos ...	602	Stavesacre ...	141, 285, 475
Soporifics ...	109	Steam Bath ...	62
Sozal ...	502	Steapsin ...	429
Sozoiodol ...	568, 602	Stearoptenes ...	174
Sozolic Acid ...	518	Sterculiaceæ ...	143
Spanish Fly ...	349	Sterisol ...	587
Sparteine ...	466, 603	Sterisol ...	550
Spearmint ...	136, 249, 416	Sternutatories ...	110
Spender's Pill ...	318	Sterules ...	40
Spermaceti ...	211, 355	Stillingia Sylvatica ...	604
Spermine ...	590, 603	Stimulants ...	111
Sphacelinic Acid ...	223, 380	Stimulating Diuretics ...	108
Sphacelotoxin ...	223	„ Expectorants ...	109
Spinal Cord Extract ...	525	Stockholm Tar ...	133, 260
Spirit Excipient ...	25	Stomachics ...	111
„ Lotion ...	284, 317	Stone Root ...	536
„ of Mindererus ...	320	Storax ...	138, 287, 476
„ of Nitrous Ether ...	184, 315	Stovaine ...	604
„ of Nitrous Ether with an Iodide in Mix- ture ...	17	Straining, Process of ...	62
„ Rectified ...	284	Stramonium ...	143, 285, 286, 475
„ of Sal Volatile ...	189	Strontium Salts ...	492, 604
Spiritus, B.P. ...	164	„ Symphorol ...	527
Spiritus Ammoniaë Compo- situs ...	189	Strophanthin ...	286, 586
„ Myrciæ ...	519	Strophanthus ...	139, 286, 476
„ Rectificatus ...	284, 315	Strychnina ...	139, 252, 286, 420
„ Vini Gallici ...	285	„ in Pills ...	34
Spirosal ...	557	“Stypage” ...	578
Spleen Pulp ...	556	Styptic Colloid ...	536
Splenic Nuclein ...	584	Stypticin ...	583, 605
Spogel Seeds ...	621	Styptics ...	111
Sponge Bath ...	330	Styptol ...	605
		Styraceæ or Styrcaceæ ...	144
		Styracol ...	558
		Styrax ...	138, 144, 287, 476

Tartarated Iron	... 228	Thermofuge	... 542
" Soda	... 280	Thiocol	... 559
Tartaric Acid	114, 183, 305, 312	Thioform	... 523
Taurocholate of Sodium	521	Thiol	565, 610
Tea Plant	... 131	Thionine Tetramethyl	... 579
" St. Germain's	... 468	Thio-resorcin	... 597
Teacupful	... 85	Thiosinamin	... 550
Tenaline	... 516	" Ethyl Iodide	550
Terebenum	289, 480	" and Sodium	
" in Mixture	... 16	Salicylate	550
Terebinthina Canadensis	289, 481	Thiuret	... 610
" Chian	... 533	Thorium Salts	... 610
Terebinthinæ Oleum	133, 289, 481	Throphleol	... 532
Ternstroëmiaceæ	... 131	Thuja Occidentalis	... 611
Terpilenol	... 608	Thus Americanum	290, 482
Terpin Hydrate	... 608	Thymaglycine	... 611
Terpine	... 608	Thyme	... 163
Terpine Di-iodide	569, 608	Thymelaceæ	... 144
Terpineol	... 608	Thymoform	... 551
Terpinol	... 608	Thymol	136, 144, 290, 482
Testes Sicca	556, 604	" Camphor	... 529
Testicular Extract	... 604	" Carbonate	... 611
Testiculin	... 604	" Iodide	... 517
Testing	... 67	Thymolin	... 611
Tetanus Antitoxin	... 512	Thymotal	... 611
Tetraiodopyrrol	... 569	Thymus Substance	... 555
Tetranitrin	... 543	Thyrocol	... 570
Tetronal	... 608	Thyroglandin	... 570
Teucrin	... 609	Thyroidectin	... 513
Thalline	... 609	Thyroidei Liquor	290, 483
Thanatol	... 557	Thyroideum Siccum	290, 483
Thebaine	253, 428	Thyro-iodin	... 570
Theine	... 202	Tinctura Pyrexialis	... 616
Theobroma Emulsion	... 39	Tinctures, B.P.	... 167
" Ethereal Solu-	... 39	Tinospora	... 623
tion	... 39	Tiodine	... 550
" Oil	143, 290, 482	Tobacco (Indian)	... 246
Theobromine	290, 609	Toddalia	... 623
Theocine	... 609	Tolylantipyrin (Tolypyrrin)	593, 611
Theophyllin	... 609	Tolysal	... 611
Thephorin	494, 609	Tolu Balsam	137, 198, 336
Therapeutic Agents	... 102	" Tinct. in Mixture	... 17
Therapeutic Action	... 102	Tonga	... 611
" Incompati-	... 80	Tonics	... 111
bility	... 80	Toughened Caustic	... 194
Therapeutics	... 296	Toxicodendrin	... 598
Theriacantha	... 25	Tragacantha	137, 291, 484
Thermiol	... 493	" as Excipient	24
Thermodin	... 610	Transfusion	... 75
		Traumaticin	351, 611
		Traumatol	568, 612

Tribromphenol	...	526
Trichloracetic Acid	...	498
Trichlor-butyllic Alcohol	...	491
Trichloromethane	...	212
Trichlorophenic Acid	...	498
Trichlorphenol	...	498
Triferrin	...	548
Triferrol	...	549
Triformal	...	587
Trigemin	...	593
Trikresol	...	493
Trilactine	...	572
Trimethylamine	...	612
Trinitrin	291,	485
Trinitroglycerin	...	291
Trional	...	612
Trioxymethylene	...	587
Triphenin	...	593
Triple Syrup	...	549
Trituration	...	67
Triticum Repens	...	612
Trochisci, B.P.	...	170
Trochiscus Bases	...	170
Tropacocaine	...	535
Trypsin	...	429
Trunecek's Serum	...	473
Tuberculin, Calmette's	...	514
" New	...	513
" Ointment, Moro's	...	514
" Old	...	513
" P.T.R.	...	514
" T.R.	...	513
Tumblerful	...	85
Tumenol	...	565
Turmeric	...	145
Turkish Bath	...	329
Turpentine (Crude)	133, 269,	289
" Canada	133, 289,	481
" Chian	...	533
" Oil of	133, 289,	481
" " in Mix-	ture	16
" Stupe	...	481
Turpeth Mineral	...	564
Turpethum	...	623
Tussol	...	593
Tylarsin	...	518
Tylmarin	...	492
Tylophoræ Folia	...	623

U

Ulexine	...	612
Ulmarene	...	553
Umbelliferae	...	144
Unguenta, B.P.	...	171
Unguentum Metallorum	...	397
Unit, Immunising	508,	512
Unna's Zinc Paste	...	553
Unofficial Nomenclature	...	54
Ural	...	602
Uranin	...	597
Uranium Salts	...	612
Urari	...	539
Urea	...	613
" and Quin. Hydrochlor.	...	595
" Quinate	497,	595
Uresin	575,	614
Urethane	...	613
Urginea	...	623
Uricedin	...	575
Uritone	...	613
Urocitral	...	609
Urol	497,	595
Uropherin	575,	610
Urosin	497,	575, 614
Urotropine	...	613
" New	...	614
" Quinate	...	497
Ustilago Maidis	...	614
Uterine Substance	...	555
Uva Ursi	134, 291,	486

V

Vaccines	...	505
" Antianthrax	...	506
" Antibacillus Coli	...	508
" Anticatarrrhal	...	507
" Anticholera	...	507
" Antidysentery	...	509
" Antiglanders	...	509
" Antigonorrhœa	...	509
" Antileprosy	...	510
" Anti-Malta Fever	...	510
" Anti plague	...	510
" Antipneumococcic	...	511
" Antistaphylococcic	...	511
" Antistreptococcic	...	511
" Antituberculosis	...	513
" Antityphoid	...	514
Valerian Oil	...	524

Willow, Black	... 600
Wine, Heavy Oil of	... 184
Wine-glassful	... 84
Wines, B.P.	... 172
Wintergreen Oil	... 552
Witch Hazel	135, 233
Wood Charcoal	208, 352
" Oil	... 559
" Tar	260, 440
Wool, Cotton	... 232
" Fat	... 184
Woorara	... 539
Wormwood	... 490
Wrack	... 551

X

Xaxaquin	... 595
Xeroform	... 522

Y

Yangona Brewing	... 572
Yeast	... 584
Yellow Dock	... 599
" Bone Marrow	... 556
" Jasmine	... 139
" Wash	237, 397

Yellow Wax	... 211
Yeo's Chlorine Mixture	... 357
Yerba Santa and Yerbine	543
Yersin's Plague Serum	... 510
Yohimbine	... 616
Yolk of Egg	... 429
Young's Rule for Doses	... 77

Z

Zea Mays	135, 616
Zimphene	... 493
Zinc Paste, Unna's	553
Zinc Salts(Official)	129, 293, 487
Zinc Salts (Non-Official)	616
" Iodate	... 496
" Sulpho-Ichthyolate	566
" Valerianate	294, 486, 489
" Varnish	... 553
Zinchæmol	... 560
Zingiber	145, 294, 489
Zingiberaceæ	... 145
Zittman's Decoction of	
Sarsaparilla	... 465
Zygophyllaceæ	... 145
Zymin	... 584

Press Opinions.

"The peculiar charm of Professor Whitla's book, and we believe the reason of its universal and enduring popularity, is that it adapts itself to the needs both of the student and of the practitioner, and to this we may add the further advantage of being excellently arranged whether for continuous study or for reference. It is also full of original observation. It is, moreover, one of the best treatises on the subject we have ever perused."—*Medical Press and Circular*.

"The work bears throughout the stamp of high merit. Taken as a whole, this is the best introduction to a difficult and complicated study that could be put into a student's hands. As Dr. Whitla points out, it really brings under one cover information which, prior to its appearance, had to be sought for in two treatises at least. We may add what he has forborne to say—that it also contains information which hitherto no manual has conveyed with anything approaching to equal clearness or terseness; while in many respects, especially as concerns the practical details, he is the only available author."—*Medical News*.

"This is undoubtedly a most valuable contribution to the literature of pharmacy proper, embracing as it does every branch of *materia medica*. The third part will be found to be quite a mine of wealth to the young practitioner. Dr. Whitla is evidently an accomplished practical pharmacist; he never neglects an opportunity of impressing on his brethren the necessity of making themselves experts like himself."—*Chemist's Journal*.

"The book supplies in a convenient form what one is usually obliged to search for in two or three larger works. It meets a want which has been much felt by students, and will not only be very useful to them, but also to practitioners in general. The high standard attained by the first edition is not only maintained, but surpassed."—*Practitioner*.

"Dr. Whitla's book is well written, and will prove a useful student's manual. It will be seen from the foregoing analytical notice that Dr. Whitla's work is evidently written to meet the wants of a very wide circle of readers; practitioners, medical students, and students of pharmacy alike may find within its pages that information which is required in their several callings. We can honestly say that so instructive and well designed a manual has not often fallen into our hands, and the reviewing of it has been a pleasure, not a burden. It is one of the ablest textbooks with which it has been our good fortune to meet in the course of our editorial labours. It is indeed such a work as was to be expected from the pen of one who enjoys an established reputation as an able, earnest, and successful teacher. Professor Whitla has nothing to fear from honest criticism. The literary style of the volume is of no mean order of merit, and reflects credit upon the late Queen's University in Ireland, of which the author is a distinguished alumnus."—*Dublin Journal of Medical Science*.

[To face page 670.]

PRESS OPINIONS.

"The work is one which could scarcely be too highly recommended to all. It is a model of condensation, and it would be difficult to conceive a better utilisation of space, or the possibility of communicating more information within its limits."—*Therapeutic Gazette*.

"The production of this volume proves that the author possesses literary talent combined with patient research. The reader will be surprised at the lucidness and learning displayed, and how every detail is brought up to the latest discoveries in the different branches of medical literature."—*American Medical Bulletin*.

"This manual fully comes up to its already high reputation, and will be welcome to the student; it reflects, moreover, great credit on the teaching capacity of its author. We predict for it a future increase of the great popularity which it has already attained."—*British Medical Journal*.

"Dr. Whitla's manual created such a favourable impression upon its first appearance that it is with much pleasure we record the publication of a new and enlarged edition. It is now well abreast of the times, the information given being of the most comprehensive character."—*Lancet*.

"Of the few good composite works the one before us is unquestionably the most successful example. In the course of seven years Professor Whitla's book has seen five editions, some of these numbering as many as 4,000 copies, and it remains at present as complete and interesting a textbook as we have in the English language. In reviewing the first edition of this work we alluded to its interest and value to the practising Pharmacist, and, with the permission of the Author, we quoted a short chapter of general hints to dispensers. That quotation of ours has been travelling ever since through the numberless American medical and pharmaceutical journals, and occasionally turns up again in Europe, showing that the general judgment of editors at least coincides with our own."—*Chemist and Druggist*.

"This manual is now so well known and so widely used by students and practitioners that very little new can be said regarding it. Much of it has been rewritten, and the whole brought well up to date. The section on pharmacy is brimful of valuable hints; that on materia medica is at once clear and concise. In the part which treats of therapeutics brevity and accuracy go hand-in-hand. The section on non-official remedies is wonderfully complete, no remedy of any consequence being omitted."—*Medical Press and Circular* (seventh edition).

"Few books have better deserved the continued popularity which they have obtained than Whitla's *Materia Medica*. Edition after edition appears, always presenting the same general form, but always giving evidence of careful and thoughtful supervision and of a constant endeavour to keep it abreast with the times. The book is essentially a practical one, and by endeavouring always to embrace what the student wants to know it has attained its present position."—*The Hospital*.

BY THE SAME AUTHOR.

CROWN OCTAVO. FIFTH EDITION (IN PREPARATION).

LONDON: BAILLIÈRE, TINDALL AND COX

A Dictionary of Treatment

INCLUDING

MEDICAL AND SURGICAL THERAPEUTICS.

Press Opinions.

“ Professor Whitla’s *Dictionary of Treatment* is intended to be a supplement or companion to his well-known *Manual of Pharmacy, Materia Medica, and Therapeutics*. The result is the production of a book of nearly a thousand pages in small type containing perhaps more actual information about treatment than any other English work on Medicine or Surgery. The plan of the book is indeed new. It is a DICTIONARY of treatment. Coming next to the actual substance of the work, we find that it consists, as we have already said, of an enormous mass of information. Indeed, we have to complain of a very *embarras de richesses*. The *Dictionary of Treatment* as it now appears is a remarkable monument of industrious reading, intelligent reflection, and extensive practical experience. The range of subjects through every province of disease and even of injury is astonishing in these days of specialism. Professor Whitla may be proud of this handsome embodiment of his knowledge of the use of medicines.”—*The Practitioner*.

“ Dr. Whitla’s *Dictionary of Treatment* deserves many editions. The value of such a book to a busy practitioner can hardly be over-estimated. The fourth edition has increased in size by fifty pages, but the wonder is that not only general medical and surgical treatment, but even the management of the diseases of the eye and ear, can be comprehensively considered in so short a space.”—*British Medical Journal*.

“ All Irish physicians and surgeons must feel an honest national pride in the success which has attended this well-known and widely-appreciated work. It is probably the most popular textbook on the subject in existence, and we heartily congratulate Dr. Whitla on the issue of his fourth edition. Everyone who knows the thoroughness of Dr. Whitla’s work will readily believe his statement that

this edition has been thoroughly revised, brought up to date, and in great part rewritten. Its widespread popularity is, perhaps, best shown by the fact that since the last issue in England the work has passed through two editions printed in the Chinese language at Hangchow."—*The Dublin Journal of Medical Science*.

"The Dictionary is in short the recorded experience of a practical scientific therapist, who has carefully studied diseases at the bedside and in the consulting-room, and has earnestly addressed himself to the cure and relief of his patients. Dr. Whitla is to be congratulated upon the thoroughness with which he has realised his ideal. His extensive knowledge of medicinal and other therapeutic agents, and the exceptional opportunities he has enjoyed of testing these clinically, combined with careful observation and untiring industry, have led to the production of a book which will add to his own reputation, and will prove of great practical service to large numbers of his professional brethren."—*Glasgow Medical Journal*.

"The book seems to be one of the best of its class."—*Therapeutic Gazette*.

"It is the most complete and satisfactory work of its kind published."—*International Journal of Medical Sciences*.

"This is a work which fills a void long felt in medical literature."—*Journal of British Health Reports*.

"It may at once be said that Dr. Whitla has very fairly succeeded in what might almost have been thought to be a superhuman task, in supplying a book which is intended to serve as a guide to the practical treatment of almost everything that is capable of being treated by drugs. It is also rendered more practical by the insertion of numerous formulæ which the author has found valuable."—*The Lancet*.

BY THE SAME AUTHOR.

CROWN OCTAVO. 2 VOLS., 1900 PAGES. 25S. NET.

LONDON: BAILLIÈRE, TINDALL AND COX, HENRIETTA STREET.
1908.

Practice and Theory of Medicine.

Contains in two handy volumes a comprehensive description of the Etiology, Pathology, Symptomatology, Diagnosis, and Treatment of Medical Diseases, including Tropical and Skin Affections.

Press Opinions.

"Sir William Whitla has succeeded in placing a vast amount of information within these two volumes. The various sections are well written, and comprise a full account of the numerous diseases which are considered. The paragraphs dealing with etiology and pathology are fully up to date, and the clinical phenomena are well described. We have been particularly interested in several of the sections. Excellent accounts are given of tuberculosis as affecting the various organs of the body. The sections on the specific fevers are full and explicit, the remarks on diagnosis being especially valuable. We can cordially recommend this book to the practitioner as a useful work of reference."—*The Lancet*, May, 1908.

"The remarkably comprehensive manual of the *Practice and Theory of Medicine* would not be the work of Sir William Whitla if it were not characterized by great literary ability and skill. All the articles attain a high level of excellence. The articles on dyspepsia may be taken as an example of the method of the book. This classification strikes us as highly practical, and illustrates the use to which the book may be put for immediate reference when the practitioner is in search of hints in diagnosis and treatment.

"In conclusion, we may repeat the opinion with which we began, that the work is remarkably comprehensive, and may add that there is throughout an individual note which gives unity to the whole."—*British Medical Journal*, May, 1908.

"These two volumes are packed with careful studies of medical subjects, arranged in alphabetical order, written in the author's pleasant, flowing style, which is easy to read and to remember. It is abundantly clear that the author's knowledge is exhaustive, and that he has put the greater part of it to the test of actual experience.

The pathological anatomy, the pathology, the symptoms, and the treatment are fully discussed, and the whole space covered by the account of gastric ulcer extends to fifteen closely printed pages. A similar thoroughness pervades the book. We can only say that he has succeeded admirably in his object, and that these two volumes will be found excellent works of reference for all ordinary practice."—*Medical Press and Circular*, July, 1908.

"As a convenient, short handbook of medicine it will be widely appreciated. It is essentially practical, and contains just the information which the man in practice is most likely to require. The author, whilst mainly relying upon personal observation and experience, has also availed himself fully of the more recent special knowledge accumulated by original investigators."—*The Midland Medical Journal*, May, 1908.

"The general standard of the many articles is remarkably high, and the short résumés of the etiology and pathology of the various diseases are clear and up to date. We have consulted the manual on a variety of topics, and have been struck by the lucidity and completeness of the descriptions. The prominence of the authors' individual point of view is indeed one of the most attractive features of the work, and adds greatly to the interest of many of the articles. There is much clinical wisdom and sound practical advice scattered throughout these two volumes, and set forth with point and brevity."—*The Hospital*, May, 1908.

"Sir William Whitla has already earned the right to a place among the writers of medicine by his well-known manual, *A Dictionary of Treatment*. This method of writing on medical subjects he has made peculiarly his own, and if one may judge from the past, the present work is likely to enjoy a considerable circulation. The descriptions of the different diseases are mainly founded on the large clinical experience of the author, and consequently have a practical value and freshness, which are often so conspicuously absent in a mere compilation. It is always instructive to read a clinical description of a disease that has been written by a careful observer of wide experience, and in the volumes before us there are many such descriptions. In addition to these excellent clinical descriptions the author's wide experience has enabled him to give much useful information on the subject of prognosis and treatment. The various methods of treatment recently introduced are in many cases mentioned, and their value appraised with a fairness which one often misses in the writings of practitioners of Sir William Whitla's experience."—*Dublin Journal of Medical Science*, May, 1908.

An Abridged List of Works

PUBLISHED BY

BAILLIÈRE, TINDALL & COX.

AARONS' Gynæcological Therapeutics.

Crown 8vo. Pp. xiv + 178, with 46 Illustrations. Price 5s. net.

ANDREW'S Age Incidence, Sex and Comparative Frequency in Disease.

Demy 8vo. Pp. xx + 440. Price 10s. 6d. net.

AXENFELD'S Bacteriology of the Eye.

Translated by ANGUS MACNAB, F.R.C.S. Royal 8vo. Pp. xv + 410, with 105 Illustrations, mostly coloured. Price 21s. net.

BIANCHI'S Text-book of Psychiatry.

Royal 8vo. Pp. xvi + 904, with 106 Illustrations. Price 21s. net.

BIDWELL'S Handbook of Intestinal Surgery.

Second Edition. Demy 8vo. Pp. xiv + 215, with 120 Illustrations. Price 6s. net.

BRAND & KEITH'S Clinical Memoranda for General Practitioners.

Crown 8vo. Pp. x + 208. Price 3s. 6d. net.

BROWN'S Physiological Principles in Treatment.

Second Edition. Crown 8vo. Pp. viii + 392. Price 5s. net.

BUCHANAN'S Manual of Anatomy, Systematic and Practical, including Embryology.

In 2 volumes. Price 12s. 6d. each net. Or complete in 1 volume. Price 21s. net. Demy 8vo. Pp. 1572, with 631 Illustrations, mostly original, and in several colours. (*University Series.*)

CALDWELL'S Military Hygiene.

Second Edition. Demy 8vo. Pp. xiv + 580, with 80 Illustrations, mostly original. Price 12s. 6d. net.

CALKINS' Protozoology.

Royal 8vo. Pp. xii + 350, with 4 Coloured Plates and 125 Illustrations. Price 15s. net.

CAMPBELL'S On Treatment.

Crown 8vo. Pp. viii + 422. Price 5s. net.

CASTELLANI & CHALMERS' Manual of Tropical Medicine.

Demy 8vo. Pp. xviii + 1242, with 14 Coloured Plates and 373 Illustrations, mostly original. Price 21s. net. (*University Series.*)

CROOK'S High-Frequency Currents.

Second Edition. Demy 8vo. Pp. x+206, with 44 Illustrations. Price 7s. 6d. net.

DIEULAFOY'S Text-book of Medicine.

Translated by V. E. COLLINS and J. A. LIEBMANN. In 2 volumes. Royal 8vo. Pp. xxiv+2082, with 7 Coloured Plates and 105 Illustrations. Price 25s. net.

ELDER'S Ship-Surgeon's Handbook.

Second Edition. Crown 8vo. Pp. xii+388. Price 5s. net.

FRENCH'S Medical Laboratory Methods and Tests.

Second Edition. Pp. viii+168, with 2 Coloured Plates and 88 original Illustrations. Leather, gilt tops. Price 5s. net.

FREYER'S Clinical Lectures on Surgical Diseases of the Urinary Organs.

Demy 8vo. Pp. viii+425, with 141 Illustrations, mostly original. Price 12s. 6d. net.

GARDNER'S Surgical Anæsthesia.

Crown 8vo. Pp. xii+240, with 12 Plates and 35 other Illustrations. Price 5s. net.

GEMMELL'S Chemical Notes and Equations.

Second Edition. Crown 8vo. Pp. xiv+266. Price 5s. net.

GRAY'S Diseases of the Ear.

Demy 8vo. Pp. xii+388, with 53 Plates, of which 37 are Stereoscopic, and 70 other Illustrations. Price, with Stereoscope, 12s. 6d. net.

GREEN'S Pathology.

Tenth Edition. Royal 8vo. Pp. viii+636, with Plate and 348 Illustrations, plain and coloured. Price 18s. net.

HYDE'S Diseases of the Skin.

Eighth Edition. Royal 8vo. Pp. xxviii+1126, with 58 Plates and 223 Illustrations, Plain and Coloured. Price 25s. net.

JELLETT'S Manual of Midwifery.

Second Edition. Demy 8vo. Pp. xiv+1210, with 17 Plates and 557 Illustrations, plain and coloured. Price 21s. net. (*University Series.*)

KERR'S Operative Midwifery.

Second Edition. Royal 8vo. Price 21s. net.

[*In the press.*]

KNOCKER'S Accidents in their Medico-Legal Aspect.

A Practical Guide for the Expert Witness, Solicitor, and Barrister, by leading Medical Authorities. Royal 8vo. Pp. xxviii+1266. With 206 Illustrations, Plates, and Diagrams. Price 30s. net.

LAKE'S Handbook of Diseases of the Ear.

Third Edition. Demy 8vo. Pp. xii+248, with 4 Coloured Plates and 66 Original Illustrations. Price 7s. 6d. net.

LAMB'S Diseases of the Throat, Nose, and Ear.

Crown 8vo. Pp. xvi+322, with 55 Illustrations. Price 7s. 6d. net.

LAMBKIN'S Syphilis: its Diagnosis and Treatment.

Demy 8vo. Pp. viii+193. Price 5s. net.

LAVERAN & MESNIL'S Trypanosomes and the Trypanosomiasis.

Translated and Edited by DAVID NABARRO, M.D. Royal 8vo. Pp. 538, with Coloured Plate and 81 Illustrations. Price 21s. net.

MACEWEN'S Surgical Anatomy.

Demy 8vo. Pp. xii+452, with 61 Illustrations, plain and coloured. Price 7s. 6d. net.

McKAY'S Operations upon the Uterus, Perineum, and Round Ligaments.

Demy 4to. Pp. xvi+454, with 148 original Plates. Price 21s. net.

McKISACK'S Dictionary of Medical Diagnosis.

Demy 8vo. Pp. xii+584, with 77 Illustrations. Price 10s. 6d. net.

MAY & WORTH'S Diseases of the Eye.

Second Edition. Demy 8vo. Pp. viii+400, with 336 Illustrations, including 22 Coloured Plates. Price 10s. 6d. net.

MONRO'S Manual of Medicine.

Third Edition. Demy 8vo. Pp. xxii+1024, with 42 Illustrations, plain and coloured. Price 15s. net. (*University Series*.)

MUMMERY'S After-Treatment of Operations.

Third Edition. Crown 8vo. x+252, with 38 Illustrations. Price 5s. net.

ONODI'S Optic Nerve and Accessory Sinuses of the Nose.

Translated by J. LÜCKHOFF, M.D. Small 4to. Pp. viii+102, with 50 original Plates and Illustrations. Price 10. 6d. net.

OSTERTAG'S Handbook of Meat Inspection.

Third Edition. Royal 8vo. Pp. xxxvi+886, with Coloured Plate and 260 Illustrations. Price 31s. 6d. net.

POLITZER'S Text-book of Diseases of the Ear.

Fifth Edition, entirely rewritten. Translated by M. J. BALLIN, M.D., and P. H. HELLER, M.D. Royal 8vo. Pp. xiv+892, with 337 original Illustrations. Price 25s. net.

RAMSAY'S Diathesis and Ocular Diseases.

Crown 8vo. Pp. viii+184, with 17 Plates. Price 3s. 6d. net.

ROBERTSON'S Meat and Food Inspection.

Demy 8vo. Pp. x+372, with 40 Illustrations. Price 10s. 6d. net.

ROSE & CARLESS' Manual of Surgery.

Seventh Edition. Demy 8vo. Pp. xvi+1376. With many new and original Illustrations. Price 21s. net. (*University Series.*)

SCALES' Practical Microscopy.

Second Edition. Crown 8vo. Pp. xvi+334, with 122 Illustrations. Price 5s. net.

STARR'S Organic and Functional Nervous Diseases.

Third Edition. Royal 8vo. Pp. 912, with 29 Plates, plain and coloured, and 300 Figures in the text. Price 25s. net.

STEVEN'S Medical Supervision in Schools.

Demy 8vo. Pp. x+268, with 40 Illustrations. Price 5s. net.

STEWART'S Manual of Physiology.

Sixth Edition. Demy 8vo. Pp. xx+1064, with 2 Coloured Plates and 449 Illustrations. Price 18s. net. (*University Series.*)

TREDGOLD'S Mental Deficiency.

Demy 8vo. Pp. xviii+391, with 67 Illustrations and 9 Charts. Price 10s. 6d. net.

TUCKEY'S Treatment by Hypnotism and Suggestion.

Fifth Edition. Demy 8vo. Pp. xviii+418. Price 10s. 6d. net.

TURNER'S Radium.

Crown 8vo. Pp. x+88. With 20 Plates and other Illustrations. Price 5s. net.

WALSH'S The Röntgen Rays in Medical Work.

Fourth Edition. Demy 8vo. Pp. xviii+434, with 172 Plate and other Illustrations. Price 15s. net.

WALTERS' Open-Air or Sanatorium Treatment of Pulmonary Tuberculosis.

Demy 8vo. Pp. xvi+323, with 29 Illustrations. Price 5s. net.

WHEELER'S Operative Surgery.

Second Edition. Demy 8vo. Pp. xiv+296, with 157 Illustrations. Price 7s. 6d. net.

WHITLA'S Medicine. In two volumes. Price 25s. net.

„ **Materia Medica.** Ninth Edition. Price 9s. net.

„ **Dictionary of Treatment.** Fifth Edition.

[*In preparation.*]

WILLIAMS' Minor Maladies and their Treatment.

Second Edition. Crown 8vo. Pp. xii+404. Price 5s. net.

YOUNGER'S Insanity in Everyday Practice.

Second Edition. Crown 8vo. Pp. viii+124. Price 3s. 6d. net.

LONDON :

BAILLIÈRE, TINDALL & COX, 8, HENRIETTA ST., COVENT GARDEN.

9/2

